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***USSR: Science &
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CONTENTS

14 May 1991

Organization, Planning, Coordination

USSR AS General Meeting Criticized for Lack of Action [Yu. Danilin; <i>IZVESTIYA (Union edition)</i> 19 Mar 91]	1
Makarov Report on State of USSR Academy of Sciences [I. Makarov; <i>POISK</i> , No 12 (98), 15-21 Mar 91]	3
Marchuk Report at USSR Academy of Sciences Annual General Meeting [G. Marchuk; <i>POISK</i> , No 12 (98), 15-21 Mar 91]	6
Marchuk Notes Policy Needs at USSR Academy of Sciences General Meeting [A. Pokrovskiy; <i>PRAVDA (2d edition)</i> 14 Mar 91]	10
Major Research Programs Endangered by Union Breakup [N. Laverov; <i>RABOCHAYA TRIBUNA</i> , 13 Mar 91]	14
CPSU Science, Education, Culture Commission Members Speak Out [V. Kerimov, A. Pokrovskiy; <i>PRAVDA (2d edition)</i> , 2 Mar 91]	15
Laverov Reviews Central Government's Science Policy [N. Laverov; <i>PRAVDA (2d edition)</i> 1 Mar 91]	19
Physics Institute Director on Problems of Basic Research [A. Borovik-Romanov Interview; <i>POISK</i> , No 6 (92), 1-7 Feb 91]	22
Science Official Criticizes Wage Contract System for S&T Workers [A. Kulagin; <i>RADIKAL</i> , No 5, Dec 90]	24

Budget, Finance

Innovation Bank Fails To Meet Expectations [B. Konovalov; <i>IZVESTIYA (Union edition)</i> , 10 Apr 91]	27
Agricultural Scientists Protest Self-Financing Reforms [<i>PRAVDA (2d edition)</i> , 2 Apr 91]	27
Discussions End on Contract Pay for S&T Workers [I. Yelin Interview; <i>POISK</i> , No 10 (96), 1-7 Mar 91]	29

Facilities, Manpower

Functions of New USSR Academy of Sciences Commission for Property [O. M. Nefedov Interview; <i>POISK</i> , No 12 (98), 15-21 Mar 91]	30
Organizational Changes, Issues in USSR Academy of Sciences	31
Geological Information Center [Ye. Valentinova; <i>POISK</i> , No 10 (96), 1-7 Mar 91]	31
UrAn Introducing Firm [L. Usacheva; <i>POISK</i> , No 10 (96), 1-7 Mar 91]	31
Far East Publishing in Peril [V. Oshchenko; <i>POISK</i> , No 10 (96), 1-7 Mar 91]	31
Botany Institute Personnel Not Paid [A. Sosnov; <i>POISK</i> , No 10 (96), 1-7 Mar 91]	32

Training, Education

Educational Reforms Essential for Soviet Science [A. Karlyuk; <i>SOVETSKAYA BELORUSSIYA</i> , 23 Mar 91]	33
---	----

Automation, Information Policy

Defense Secure Document Transmission System To Be Marketed [V. Remizov; <i>IZVESTIYA (Union edition)</i> , 21 Mar 91]	36
--	----

Patents, Inventions

Draft Patent Law Stalled; Criticism Renewed [V. Dozortsev; <i>EKONOMIKA I ZHIZN</i> , No 4, Jan 91]	37
---	----

Technology Transfer

Increased Contacts With Russian Emigre Scientists in Israel Foreseen [S. Kukhianidze; MOSKOVSKAYA PRAVDA 12 Jan 91]	39
--	----

Regional Issues

Democratization Committee Formed for Ukrainian Academy of Sciences [V. A. Kuzmenko Interview; KOMSOMOLSKOYE ZNAMYA, 10 Apr 91]	40
Special Committee To Develop Estonian Science Policy [V. Ehatamm; SOVETSKAYA ESTONIYA, 20 Mar 91]	40
Organizational Progress in RSFSR Academy of Sciences	41
Yeltsin Decree Published [POISK, 1-7 Mar 91]	41
Voronezh Branch Planned for Chernozem Zone [SOVETSKAYA ROSSIYA (1st edition), 12 Mar 91]	41
Report on Russian Academy of Natural Sciences [A. Pokrovskiy; PRAVDA (2d edition), 27 Mar 91]	41
Moldovan Sovereignty Creates Problems for Republic Science [N. Dubina; SOVETSKAYA MOLDOVA 19 Feb 91]	42
Discussion on Formation of Bashkir Academy of Sciences	44
Declaration of Bashkir Supreme Soviet Presidium [A. Valev; TRUD, 19 Feb 91]	44
Local Academicians Protest [A. Zinovyev; IZVESTIYA, 16 Feb 91]	44
Columnist, RSFSR Official Debate Decision [V. Shorin Interview; LITERATURNAYA GAZETA, No 8, 27 Feb 91]	44
Discussion Supports Independence [G. Tolstikov, V. Kazakov, et al.; IZVESTIYA, 28 Feb 91]	48
Argument Against Independence [K. Smirnov; IZVESTIYA 28 Feb 91]	49
Establishment of Estonian Engineering Academy Recommended L. Volgin; SOVETSKAYA ESTONIYA 14 Feb 91]	50
New Regional Scientific Institutions Established	51
Belorussian Engineering Academy [V. Chachin, V. Koleshko Interview; SOVETSKAYA BELORUSSIYA, 10 Jan 91]	51
Estonian Chemistry Society [E. Elmann; VECHERNYY TALLINN 13 Feb 91]	52
Khabarovsk Scientific Center [SOVETSKAYA ROSSIYA 1 Mar 91]	53
Accomplishments of Kazakh SSR Academy of Sciences Summarized [A. A. Abdulin, T. B. Tursunbayev, et al.; VESTNIK AKADEMII NAUK KAZAKHSKOY SSR No 12, Dec 90]	53

Miscellaneous

Market Economy Poses 'Danger' to Academy Science [V. Afanasyev; PRAVDA (2d edition), 18 Apr 91]	58
Biologist Claims Soviet Research Establishment Superior to U.S. [L. Margolis; NEDEL'YA, No 14, 1 Apr 91]	61
Privileges, Personal Benefits of USSR AS Presidium Members Revealed [V. Smirnov; ARGUMENTY I FAKTY, No 10, Mar 91]	63
Law on State S&T Policy Makes Little Progress [POISK, No 8 (94), 15-21 Feb 91]	65
President of USSR Academy of Medical Sciences Interviewed [V. I. Pokrovskiy Interview; POISK, No 7 (93), 8-14 Feb 91]	68
Leskov on Keldysh Anniversary, Growth of Academy Bureaucracy [S. Leskov; IZVESTIYA (Union edition) 11 Feb 91]	72
Experimentation With Perftoran Blood Substitute Continues [V. Pokrovskiy; RADIKAL, No 5, Dec 90]	75

Awards, Prizes

Nominees for State Prizes in Science, Technology Announced [IZVESTIYA, 17 Apr 91]	76
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USSR AS General Meeting Criticized for Lack of Action

917A00102A Moscow IZVESTIYA (Union edition)
in Russian 19 Mar 91 p 2

[Article by Yu. Danilin: "Knowledge Is Dwindling—Academies Are Growing Like Mushrooms. Notes on the Themes of the General Meeting of the USSR Academy of Sciences"]

[Text] Another general meeting of the USSR Academy of Sciences was held and a depressing impression remained. The "self-developing organism that is not dependent on state structures," as the presidential Ukase called the academy, in no way declared itself. The same speakers, the same rhetorical questions and responses, which do not bind anyone in any way, and not the slightest hint of a specific decision or action. Such a meeting is exclusively for the expression of anxiety in one regard or another....

I would like to know, for example, how many more decades will the appeal "to change resolutely the situation in scientific instrument making" be heard? When this phrase is heard, a reassuring nod of the chairman follows: Yes, they say, it is necessary. Time passes. And everything, as you can easily guess, is repeated. Having heard the familiar statement today, I thought, what strange academic resolve this is. One that probably does not have analogs. But then one that implies a specific name and position. They are never named. The causes of such a state of neglect are also not analyzed. Excellent experienced hands and inventive minds prefer meanwhile cooperatives and joint ventures. A hypocritical picture is forming: The problem is clear and the anxiety is obvious (the speakers, who do not get tired of repeating the same thing, and the presidium, which nods in agreement), but there is still no production—which is modern and meets to any extent the demand. Why not dwell once on this statement and find out: What is happening? For this concerns any direction of science and any researcher.

But no, such a thing does not exist in tradition. It is better to talk about everything a little at a time. It is unknown who invented such impractical traditions. But the presidium is willingly following them. Academician G.I. Marchuk in the opening speech made the appeal for it to be clearly specified what meaning should be incorporated in the concept of the "democratization" of the management of science (I am carrying over the quotation marks from the original speech). He reported interesting data of sociologists, who surveyed at 14 institutes about 1,000 scientific personnel. A positive attitude toward the election of the director of the institute was expressed by 43 percent of those surveyed, a positive attitude toward the election of the managers of structural subdivisions was expressed by 52 percent. Mainly young scientific associates endorse the prospects of the introduction of a contract system at the academy and people of an older age reject them. Judging from the reaction of the hall,

hardly anyone was familiar with this research. The president did not name other results. They recalled democracy in individual statements, in uninteresting and incomprehensible versions, while some people did not have enough time precisely for this part. In short, it was not "specified"....

Therefore, when Guriy Ivanovich stated as the following thesis that the main wealth of the academy is its people and it is necessary to aid their growth and "the revelation of the creative potential," I no longer wanted to believe the truth of this assertion and the corresponding intentions. Especially if you compare what was said with the editorial mail. I quote a typical letter: "...I am 40 years old. I live with my wife and little daughter in a dormitory. There is no apartment and, as I feel, there will not be one. Everything was normal, while I was dealing with my own theme. Successfully. They nominated it for the State Prize. The sponsor called and, although he had not the slightest to do with the work, ordered his own name to be added. I refused. They did not submit the work for the prize. There will indeed be no apartment. While the sponsor, an immoral, arrogant man, is imposing himself as a coauthor on a more obliging associate. He himself for a long time has not been able to do anything, although he is in the director's chair...."

Day labor, manpower, a dormitory at the age of 40-50, conflicts to the death instead of a normal scientific discussion are pretty often, in every letter. Historians of science will explain one day why the good and sensible pass and disappear forever, while the wicked adapts well. Not anywhere, but in science.

A person of an indisputable scientific reputation—Mikhail Alekseyevich Lavrentyev—did not have a care-free life. But given enormous workloads he never declined meetings with undergraduates and school children. Not ceremonial meetings—with awards and cups—but just like that, without ceremony, out of his own deep curiosity. He personally had to test the new carting—an invention of members of the club of young technicians, to shake the hand of the best knight of the Victoria Cross, and to ask students of the physical mathematical school tricky questions. He attached exceptional importance to the summer schools—a reliable university stream. And he was himself always the Chief Summer School Pupil. I envy the young inhabitants of the Academy Campus of those years—they associated with a great representative of the perishing generation of Soviet intellectuals. His inexhaustible fascinating intellectual curiosity is from there, and the sympathy for the empty young minds—"they are the future!"—also is. The system of the Physical Technical Institute is a mere formality, if in it there is not its own Lavrentyev. He would never have written a letter to the newspaper with the pretentious title "Do Not Teach the Scientist," since in the traditions of the Russian scientific intelligentsia he professed the opposite: The scientist should always learn, even from a small fry who comes to the summer physical mathematical school. But you would not teach intelligence like you would teach

physics or mathematics. And that is why this thread is already breaking somewhere. Mikhail Alekseyevich passed away. And there never appeared among any of the prominent scientists of the department, especially the directors following him, the desire to personally test a new carting or to make school children happy with tricky questions....

The alarming decrease in society of interest in science is explained, in my firm conviction, by serious personal losses in scientific surroundings. Why have I recalled Mikhail Alekseyevich? Lavrentyev was devoted to the eternal idol of the intelligentsia—self-sacrifice. In everything. The pupils of "Luzitania" all had this "fault." Did Academician Nikolay Nikolayevich Luzik, perhaps, succeed in passing to them this rare state precisely through intelligence? But no scientific school produced such a number of inspired creators.

Self-sacrifice is a philosophical trait. No one forced Nikolay Ivanovich Vavilov to gather a priceless collection—only science did. And only it supported the efforts of his associates in blockaded Leningrad, who preserved it under inconceivable conditions. But now, when no one is dying from hunger at the All-Union Institute of Plant Growing and shells are not exploding in the city, the collection of Vavilov is endangered. It is a tragic distance, is it not?...

Academician Dmitriy Konstantinovich Belyayev on the verge of death realized his fondest wish—he established a preserve of the gene stock in Cherga. For the sake of what? For the sake of science. But due to ignorant and irresponsible people the most rare species have perished here.... What is this now—our fate?

At the general meeting one of the speakers, in explaining the poor state of economic science by the long dictation of ideology, declared that he understands scientists and does not consider them to blame. They, you see, "did not have to be Zoya Kosmodemyanskayas." What a sound worldly idea! It excludes not only self-sacrifice, but also elementary decency. To great regret, it is a widespread one. Owing to such hearty practicality we are losing the ideals both in society and in science. And with them any progressive movement as well. Many young people, when beginning a life in science, are concerned not about their own views and position, but about mastering as diligently as possible the simple conformist rules which make it possible to live without particular misfortunes. Seeing that the path was beaten by clever predecessors. Often scientific life also end with these interests. But administrative life never does. The highest chairs wait impatiently for such researchers of nature. How boring, naive, and ridiculous they find the words "for the sake of science." I observe quite often this well-nourished condescension on faces, which have not been marked by the stamp of thought, but in turn know where real wisdom is. But many have their own stamp. A more reliable one. Are you surprised later on from where the endless

misfortunes of talented researchers Leonid Aleksandrovich Firsov or Vladimir Petrovich Demikhov and their like come? From here.... And for a long time.

The price of knowledge in society is falling, the number of academies is growing from day to day. There is no paradox here. These are interdependent phenomena. The less there is of one, the more there is of the other. KOMSOMOLSKAYA PRAVDA several years ago tried to find out from older school children where they want to put their fortune to the test: Some want to in a taxi, some want to by polishing diamonds, and no one wants to in natural science. Everything about a taxi and diamonds is understandable. But what can a contemporary school child or undergraduate know about natural science? Except what is between the covers of textbooks and, as a rule, does not pertain either to science or to entertaining reading. If this is a curious school child, he reads the journal KVANT. But what if he is not? There are incomparably more such school children. We are unusually stingy precisely where it is necessary to be generous in an unrestrained manner. Knowledge needs visual promotion and a normal account of the secrets of the cell and the brain and other unusual phenomena, which is comprehensible both to a 100-year-old grandfather and to a third grade student. Whether this will be a newspaper or a journal is unimportant. The trouble is that thus far there is neither. An entire generation is already incapable of grasping intellectual information. They fall asleep on the third line.... Undergraduate students in philology of a pedagogical institute, as they knew how, conducted a survey among first and second year students of nine higher educational institutions. And they obtained stunning results: More than 70 percent of those surveyed had not read to the end a single work of Dostoyevskiy. While of Tolstoy's works they know only "Voyna i mir" [War and Peace] and "Anna Karenina"—and then from the movies, they cannot remember clearly what they are about....

Academician Nikolay Dmitriyevich Kuznetsov spoke convincingly at the meeting about the need for a new science—the science of reliability. When it is formed, one ought not forget to take into account the coefficient of fatigability in our modern society. In the West they take it into account in state interests. In order not to die one day. Our closest neighbors, the Finns, are not sparing their markkas and are opening luxurious scientific and technical centers like the Eureka Center in Helsinki. Just for the purposes of education. As if for young people. But everyone goes. It is packed with people all day.... We have for these purposes the empty Polytechnical Museum and Palace of Pioneers and School Children on the Lenin Hills. What kind of comparison can there be: It is the same as a modern rocket and a Fordson tractor....

Gennadiy Alekseyevich Yagodin, chairman of the State Committee for Public Education, in telling about the truly successful attempts of his department to modernize the secondary and higher schools, noted that it is also time to have a general concept of education in the

country. His concerns are understandable and deserve only endorsement, but at the same time it is impossible not to be astonished, if not to say more, at why thus far it does not exist. No noticeable reaction of the hall to this request of enormous importance followed: The educational trend of the meeting had probably appeased. In two full working days, incidentally, it was entirely possible to develop the concept directly here and even to find time to discuss it. It is not necessary to think about a special commission and other formalities, when Academicians S.T. Belyayev, Yu.A. Ryzhov, Yu.A. Kosygin, and V.A. Koptug, Corresponding Members Yu.L. Yershov, N.V. Karlov, and G.P. Vyatkin, and other scientists, on whose lips, as they say, this theme always is, are in the hall. Heading at different times the best educational institutions of the country, they, beyond any doubt, would find the most promising version.

But we cannot manage without commissions, consultations, and decrees, declaring simultaneously and tirelessly concern about state interests.

Science and the intelligentsia can save the school, secondary and higher. And still in embryo, at the pedagogical institute. But in the logic of our education the higher educational institution, which should be the most prestigious, the best provided for, and the most satisfactory, with equipment that is super new by world standards, is the completely opposite of that: the poorest, with casual personnel and casual students as well. Instead of the Tsarskoye Selo Lyceum there is a slightly improved version of the vocational and technical school. The real threat of being left without a future comes by no means from nuclear war, against which some scientists on lengthy foreign business trips have been fighting so ardently and for such a long time, but from the Tmutarakan pedagogical institute and its like.

Prime Minister Pavlov, I hope, was not being cunning with the intention to rely on science. I have never heard anything about the self-sacrifice of people of such a rank. But someone should be the first. One ought to seek exclusively in the interests of the people through our poor bins if only some assets to restore justice and to make precisely the pedagogical higher educational institutions the flagship of our higher school, and not an orphan's shelter for students who receive D's.

But while it is unknown whether the prime minister will consider such a pursuit acceptable, it is simply necessary to come to the students. As Viktor Petrovich Astafyev once came to a school exclusively at his own desire. It is a pity that his pedagogical experiments are little known. On the diploma of graduates of agricultural higher educational institutions it was previously signified: scientist-agronomist, for example. They do not write anything of the sort on the diploma of educators. And correctly so. This would now be quite an exaggeration. But it should not be an exaggeration in the future. In the most immediate future....

How different independence can be. The church, which is separate from the state, is trying as if to reunite with it in common concerns; it is treating with mercy where we are not able to do anything, is seeking in society a service, which is a little more difficult.... While the academy—the center of reason and knowledge—contrives all the time to detach itself from something: from sectorial academies (even their executives are never seen and heard); from ministries and departments, for which some statements and ideas would be rather interesting; from universities and even from common sense: I have in mind the most serious problems of education and the general culture and level of knowledge in society, which are directly dependent on them. Here it turns out that an organism can develop itself on a state scale and on the scale of a small village as well. Here the main thing is not to make a mistake in the scale.

Makarov Report on State of USSR Academy of Sciences

917A0121A Moscow *POISK in Russian* No 12 (98),
15-21 Mar 91 p 9

[Report on speech by Chief Scientific Secretary of the Presidium of the USSR Academy of Sciences Academician Igor Makarov at the Annual General Meeting of the USSR Academy of Sciences; date not given: "Independence, Self-Management, Fundamentality"]

[Text] At the beginning of his speech the speaker noted that the basic research being conducted at the USSR Academy of Sciences is at a quite high level and, in a number of directions, at the world level. Science for the present remains one of the very few areas, in which our country is proving itself as a great power.

The first section of the report was devoted to the problems of financing science. The speaker, in particular, said that for the most part it had been possible to overcome the difficulties of the year under review. The additional allocation to the Academy of 158 million rubles [R] for the acquisition of instruments, equipment, and computer hardware played a decisive role here.

The real increase of the amount of financing of the Academy came in two years to 35 percent. This made it possible to increase substantially the wage of scientific personnel. On the average it increased by 75 percent, moreover, among the least well-to-do junior scientific associates it was increased by twofold.

In speaking about the distribution of budget assets, the speaker noted that against the background of the increase of the average figures unevenness in the financial support of different institutes was observed. The use of allocated assets leaves much to be desired: A significant portion was frozen in the funds of institutes and was used for the wrong purpose. For a possible solution of this problem it is worth, apparently, thinking about the establishment of the commercial Akadembank.

The speaker expressed the hope that the institutes of the Academy would do everything possible to increase economic contractual work and would actively use various sources of financing: state scientific and technical programs, innovation funds, assets of public organizations.

World experience of the development of basic research does not have examples of the successful direct management of the process of acquiring scientific knowledge. The management of basic science is always indirect—through the scientist, his intellect, abilities, inclinations, and outlook. If there is a scientist with creative qualities, there are also results. In connection with this the speaker noted that the changeover to the contract system of the remuneration of the labor of the scientist as an effective means of the stimulation of creative output and departure from unwarranted leveling had been planned. The time and scale of the changeover to the contract system will be specified by each institute independently.

During the year under review the limits for many materials, equipment, and hardware were reduced significantly for the Academy. It was not possible to maintain the volume of deliveries at the 1989 level. This also happened, in particular, because the Academy was not included on the list of users of resources in accordance with the line "state needs." As a rule, the orders for equipment, materials, and instruments considerably exceeded the allocations earmarked for these purposes. Organizations of the USSR Academy of Sciences did not pay for products, which were received by the supply staff of the USSR Academy of Sciences, worth R5 million. Expensive equipment not claimed by institutes, including imported equipment, is accumulating in warehouses. Stocks of unused equipment and materials also form annually at institutes in the amount of on the order of R10 million.

The issuing of the Ukase "On the Status of the USSR Academy of Sciences," the speaker said, enabled us to be included on the list of most important organizations that are supplied in accordance with the line "state needs." Higher limits with respect to practically all types of machines, materials, and equipment have been allotted to us. However, the materialization of the limits is a difficult matter, particularly now, when a number of republics have introduced restrictions on the export of commodities. But for the time being the mutual assistance of all the currently operating academic structures is required. All types of material and technical resources should invariably be used or be put into circulation.

And finally the traditional sore spot, the speaker noted, is scientific instruments. At one time the scientific and technical association of the USSR Academy of Sciences, which began to make products that the Academy needed so much, was established. Then the Scientific Instruments All-Union Joint Stock Company, which quit the Academy, was established on its basis. But now this is a commercial structure, and there is one criterion there—

to make what is profitable. Is it correct to use in this way the potential of the former scientific and technical association?

While speaking about capital construction, I. Makarov reported that during the year under review the State Planning Committee allotted to the Academy R548 million of capital investments, of which approximately one-fourth was channeled into the social sphere. Outside contracting organizations perform more than two-thirds of the construction and installation work for the Academy and the Central Construction Administration of the USSR Academy of Sciences performs only one-third. For outside contractors it has become the norm to fulfill the plan on average at the level of 60 percent. This is one of the causes of the late completion of projects, of which we have, unfortunately, a large number of examples.

Nevertheless there were put into operation: the building of the Institute of Problems of Cybernetics in Moscow, the second section of the special design bureau of analytic instrument making and a building of the Physical Technical Institute imeni A.F. Ioffe in Leningrad, a building of the Institute of Chemistry of Highly Pure Substances in Nizhny Novgorod, the first section of the new building of the presidium in Moscow, and others.... But this year the situation with capital construction is changing not for the better. The State Planning Committee reduced the total amount of capital investments for the Academy.

What solutions are possible here? First of all we are working together with the State Planning Committee. The second direction is the enlistment of foreign firms in construction and the third is the mobilization of internal reserves and the development of the creative initiative of managers.

Then the speaker dwelt on questions of the personnel potential of the Academy. In recent years an increase of the number of people working at it has been taking place. At the end of 1990 we had about 240,000 associates, of whom 65,000 are scientific personnel. The average age of the personnel was 43. The number of members of the Academy is increasing. On 1 January 1991 there were 988 people in the Academy, of them 337 are academicians and 651 are corresponding members of the USSR Academy of Sciences. In the election in December 1990, 45 full members and 136 corresponding members of the USSR Academy of Sciences were elected. These scientists, who are well known in the country and the world, are a worthy reinforcement of our Academy.

Not everything is going smoothly with the hiring of young specialists at the Academy. Every year the number of refusals to hire them doubles. There are two main reasons: the changeover to the new conditions of the remuneration of labor and the lack of rooms in dormitories. In spite of this, the Academy is striving to use all forms of access to the selection of the best trained and

most talented graduates of higher educational institutions. Young, talented scientists are the basis of the development of the Academy.

Having touched upon the "personnel drain," which is proceeding in various directions—through cooperatives, joint ventures, foreign organizations—Academician I. Makarov noted that the scale of the "drain" is becoming appreciable. The losses often occur in vanguard directions. The Academy is losing chemists, programmers, electronic engineers, mechanics experts, and specialists in molecular biology and solid-state physics and in applied mathematics.

The speaker addressed to the people's deputies the request to take a more active stand in matters of the priority allocation and the construction of office premises for the Academy. For the situation with the housing of institutes, particularly in Moscow, is complicated. Labor safety and public health standards are often violated. Today about 15,000 workplaces do not meet the standards. More than 50,000 associates, including more than 20,000 women, are working under the conditions of harmful and dangerous production factors.

Proceeding to questions of the management of scientific research, the speaker singled out the main principle, which, in his words, has become an integral part of the life of the Academy—the consistent democratization of management.

Now the departments of the Academy themselves formulate scientific programs, coordinate research, and distribute financial and material resources. The institutes of the Academy independently plan research and change their own structure.

The role of the scientific community in general and particularly of scientific councils and commissions for problems is increasing.

The next section of the report was devoted to questions of the infrastructure of our science. The speaker reported that in 1990 new scientific centers of the USSR Academy of Sciences—the Saratov and Samara centers—were established. The Karelian, Kazan, and Dagestan affiliates of the USSR Academy of Sciences were converted to scientific centers. During the year 19 new research institutes and centers with the rights of institutes were organized: Four of them are in the area of the social sciences, 15 are in the area of the natural and technical sciences.

In speaking about publishing activity, the speaker stressed that for the first time in the last 70 years the question: How is academy book publishing to be preserved? arose with all urgency. There is one answer—by having changed radically the principles of the interrelations between academic institutions and publishing houses. Not the number of pages covered with writing, but their scientific level should become the main criterion. Today about 200 academic journals, the files of unpublished manuscripts of many of which are nearly

empty, are being published, but the run of 46 comes to less than 1,000 copies. In such a situation the thought of bringing into line of the quantity and quality of journals will contribute to the increase of their scientific level and to the reduction of the losses of the publishing house.

While speaking about the organization of exhibitions, Academician I. Makarov reported that last year 21 exhibitions were organized in the USSR and 40 were organized abroad.

R1.3 million and 30,000 foreign exchange rubles were spent on this. At the same time estimates show that, by increasing the prestige of our developments, exhibitions can yield revenues of up to \$600,000 a year.

The speaker particularly singled out the idea of the need for the establishment at the Academy of structures, which ensure the efficient use of the results of science and free scientists from the tasks on the introduction of scientific results, which are not characteristic of them.

Then the speaker dwelt on the problems of international cooperation of the Academy. In 1990 the number of foreign scientists, who visited the USSR, decreased by 38 percent as compared with 1989. In addition to the general political situation this is connected with the worsening of the conditions of the reception of guests. There are great difficulties with the purchase of airline and train tickets. As of 1 January Aeroflot halted the sale for rubles of tickets to foreign scientists for trips about the USSR. The Academy addressed to the Constitutional Oversight Committee of the USSR Supreme Soviet the request to protest this unlawful departmental act.

Concerning the interaction of the Academy with intra-union structures, the speaker particularly singled out the traditional ties with the higher school, which were developed along the line of the establishment of joint scientific educational centers, laboratories, and divisions. The Academy actively participated in the preparation of the draft of the State Program of the Development of Higher Education in the USSR.

The Academy is solving the problems of coordinating research in the country, as the speaker noted, not only through its institutes, but also through public organizations, scientific societies and scientific and technical societies, associations, committees, and centers. Thirty national committees work under the presidium. Scientists of the Academy are working in 20 all-union scientific societies.

The scientific community of the Academy became an active organizer of the work of the USSR Union of Scientists. Our scientists are working in such public associations as the Moscow Tribune, the Club of Inventors of the USSR Academy of Sciences, and others.

Having proceeded to social problems, Academician I. Makarov stressed that the housing problem is the most complicated one of them. The waiting line for the improvement of housing conditions in 1990 for Moscow

alone increased to nearly 10,000 people. The Moscow City Soviet owed the Academy 62,000 square meters of space. The situation is even worse at the regional departments of the Academy.

I am convinced, the speaker said, that the housing problem will not be solved as long as we rely only on the Moscow City Soviet. Therefore, the leadership of the presidium made the decision on the change of the specialization of the Central Construction Administration of the USSR Academy of Sciences to a significant extent to the construction of housing and social, cultural, and personal service facilities.

A large role in improving the conditions of daily life of scientists, as the speaker noted, belongs to our renewed trade unions. He stressed that the situation requires the elaboration of a comprehensive program of the solution of social problems and its approval by the general meeting of the Academy.

Then the speaker reported that during 1990 the presidium held 21 meetings, at which more than 200 questions were considered. Eleven scientific reports were discussed.

Decisions were made on a number of important scientific organizational issues.

On its own initiative the Academy prepared a draft of the new USSR Constitution. The first results of this large amount of scientific work were discussed at a meeting of the presidium of the Academy, at which the question of the Declaration of Human Rights and Freedoms was examined in light of the draft of the new Constitution, which is being drawn up.

During the year under review about 8,000 assignments of the USSR President, the Congresses of People's Deputies, the USSR and Russian Soviet Federated Socialist Republic (RSFSR) Supreme Soviets, and the government were fulfilled.

At the end of last year the staff of the presidium of the USSR Academy of Sciences was reorganized. The reorganization of management personnel and all associates of the subdivisions was carried out for the first time. The size of the staff was reduced by 169 people and comes at present to 532. This is half as many as in 1988.

In the concluding section of the report Academician I. Makarov dwelt on the role and importance, which the Ukase of USSR President M. Gorbachev "On the Status of the USSR Academy of Sciences" is called upon to have in the life of the Academy.

He noted that much work is being performed on bringing into line the ukase of the USSR President, laws, and departmental acts, which pertain to the Academy. This is an extremely important and very complicated matter. It is proceeding slowly. As it turned out, more than 500 departmental acts alone are liable to examination. This work should be expedited. Now, as never before, the

need to have at the Academy a strong legal division, which includes specialists in civil and international law, is obvious.

In development of the ukase an agreement on the establishment of the Council of Presidents of the academies of sciences of the USSR and all the union republics was signed. It became an external consultative organ for questions of the development of basic science. At the request of the members of the council President of the USSR Academy of Sciences Academician G. Marchuk became its head. The formulation of a general strategy of the development of basic research in the country and the principles of its financial, material, and technical supply and staffing, as well as international cooperation became the task of the council.

The transformation of the Academy into a truly self-managed independent organization, the speaker stressed, depends on our collective efforts. And he expressed confidence that this meeting would give new impetus to the strategy of the development of the Academy under present conditions.

Marchuk Report at USSR Academy of Sciences Annual General Meeting

917A0120A Moscow POISK in Russian No 12 (98), 15-21 Mar 91 pp 7-8

[Speech by President of the USSR Academy of Sciences Academician Guriy Marchuk at the Annual General Meeting of the USSR Academy of Sciences; date not given: "The Country Without Science Will Not Be Able To Rise Without Science"]

[Text] Our state is going through a difficult period of its history. The path of the modernization of Soviet society has turned out to be a very difficult one. However, in stating this, we are by no means questioning the necessity of perestroika.

Nevertheless, it must be realized that before the new state and economic mechanism is formed and stabilizes, a significant portion of the scientific institutions of the country will find themselves in a complicated situation. What should the role of the USSR Academy of Sciences be during this period?

The Academy of Sciences in the form, in which it has taken shape over a nearly 300-year history in our country, is an organization with great stability. It has repeatedly withstood the onslaught of accusations of the conservatism of its structure. But each time the Academy, by changing and improving, retained its leading role in the development of basic research. This was possible first of all owing to the development of scientific schools, many of which received international recognition. Both the stability of the academy structure and the intelligent development of democratic principles enabled the Academy to assemble and maintain the nucleus of scientific forces of the country during moments of crisis.

The present period is no less complicated. If now, during the transformation of state structures, we allow the disintegration of the USSR Academy of Sciences as an integral organism and the loss of its personnel potential, irreparable harm will be done to all science of the country. And even when the political and economic crisis has been overcome, the country will not be able to rise without its own strong science.

In modern society, even given the most liberal market economy, science grows deep into the tissue of the state organism, and its state to a large degree is determined by the situation in society. In any developed country science is regarded as "a national resource" and is in a priority position.

The scientific potential of the USSR Academy of Sciences was developed by the efforts of the entire country and is the common property of the Soviet Union. We regard the Academy of Sciences as an important element of the state system and support the position of the USSR President, which is aimed at the strengthening of the modernized Union.

With allowance made for this the Ukase of the USSR President "On the Status of the USSR Academy of Sciences" seems exceptionally important. It sets specific directions of the restructuring of the Academy as a self-developing organism that is independent of state structures. In it practically all the most important aspects of the vital activity of the Academy are touched upon: the legal status of the USSR Academy of Sciences, the system of the financing of basic research, the development of democratic principles and the social sphere, the improvement of manning and material and technical supply, the development of international and foreign economic relations.

The self-sufficiency of the Academy and its independence from state and social structures, which are envisaged by the ukase, are undoubtedly enabling the Academy of Sciences to carry out our internal reforms in conformity with our own logic of development and the needs of scientific research.

Now the time has come to specify clearly what meaning we should incorporate in the concept of the "democratization" of the management of science. I think that at the initial stage of perestroika we interpreted in a too simplified manner the concept of democratization, there was no thorough conceptual understanding even at the Academy itself. The survey at 14 institutes of the Academy, which was recently conducted by the Institute of Sociology of the USSR Academy of Sciences and encompassed about 1,000 scientific associates, showed that as a whole the results of the set of measures, which we call "democratization," are appraised ambiguously.

Thus, only 43 percent of the respondents now express a favorable attitude toward the electivity of the director of an institute, while 52 percent express a favorable attitude toward the electivity of the administrators of structural subdivisions. The prospects of the introduction at the

Academy of Sciences of a contract system are also perceived ambiguously by the scientific community—from complete support among young scientific associates to rejection by a large portion of the people of older age. This testifies that we should be very cautious and flexible when selecting new forms of the organization of academic structures. Every change of any mechanisms and relations, even if they seem hopelessly obsolete and archaic to us, must be accompanied by a prediction of the consequences.

I, for example, would like to consult you about what our institutes should be like. In recent times suggestions have been voiced on the transformation of large institutes into associations of small problem-oriented independent research institutions. I believe that all the potential transformations of institutes should be specified by the collectives themselves on the basis of their traditions, existing scientific schools, and the availability of young resourceful groups of scientists, who advance promising interesting scientific ideas.

In many cases this is, apparently, advisable, inasmuch as for a long time the development of science was connected with absurd statutes, in accordance with which a higher category in the remuneration of labor was tied with the number of associates of the institute, which also incited artificial, at times unfounded growth.

It is worth thinking about the improvement of the interrelations of the presidium, the departments, and the scientific organizations that are a part of them. This is especially important when institutes become more and more financially and economically independent.

That is why after the issuing of the ukase we began to review the statute on the department and the basic principles of the charter of the institute, are making more precise the provisions of the charter of the Academy of Sciences, are reviewing publishing activity, international relations, and so on.

Now another important question. The transfer to the exclusive ownership of the Academy of Sciences of the fixed capital and all the property of institutes, organizations, and enterprises of the USSR Academy of Sciences is spoken about in the ukase. The difference in the interpretation of this provision of the ukase, as is known, caused some tension in the collectives of institutes and the scientific community. A number of scientists interpreted this as the transfer of all the property to the personal ownership of full members of the Academy.

It think that the following provision was correct. The USSR Academy of Sciences as the collective owner delegates the rights to dispose of this property to its subdivisions—institutes, organizations, and enterprises. The property that is of national importance—large research facilities, accelerators, telescopes, supercomputers, and others—should be declared academywide property. This also concerns fixed production capital.

The forms and limits of the delegated rights of ownership should be elaborated specially, and they should ensure the freedom of scientific creativity and preserve the Academy of Sciences as a unified whole. A working group under the supervision of Vice President Academician O. Nefedov is now engaged in the solution of this problem.

I think that the need has arisen for the elaboration of an integral concept of the independence of the Academy, which stipulates not only the internal mechanisms, but also the questions of the effective interaction of the USSR Academy of Sciences with the academies of sciences of the republics, higher educational institutions, and all social and state structures of the country.

It is impossible not to see that the new relations are already now having an effect on the life of the Academy of Sciences. This is appearing in serious structural changes: New institutes are emerging (about 20 during the year under review, the size of the majority of them does not exceed 50-60 associates). The number of joint ventures is increasing (there are now more than 50 of them), small enterprises are appearing, new structures are emerging within traditional institutes.

The financing of the basic sciences is a very important question. For 1991 the USSR Academy of Sciences is receiving base financing in the amount of 1.646 billion rubles [R], of them R416 million are for the regional departments. Moreover, R400 million have been allocated for the assurance of the fulfillment of basic research programs through the State Basic Research Fund. Besides this, institutes and institutions can obtain additional financing for participating in the fulfillment of state scientific and technical programs. A portion of the assets of these funds can be obtained by institutes of the USSR Academy of Sciences. The presidium has decided to submit our academywide programs to the State Basic Research Fund. It is proposed to carry out the distribution of the grants in these funds through all-union competition.

I should say that, taking into account the overall increase of the cost of products and services and rent, the situation with finances is complicated, however, in light of the general financial difficulties in the country it is possible to consider that much attention has been shown to the USSR Academy of Sciences on the part of the USSR Supreme Soviet and the USSR Cabinet of Ministers.

It is particularly necessary to speak about the wage at the USSR Academy of Sciences. A decree on the introduction of the institution of advisers for members of the Academy was adopted four years ago. Experience has shown that this was a timely step, which made it possible to use efficiently the scientific knowledge and experience of the older generation of scientists of the Academy and to provide them with the necessary social protection. In development of this process on the basis of the ukase of the President the presidium of the USSR Academy of

Sciences adopted a decision on the increase of the wage for all scientific associates of the Academy. Thereby we succeeded in taking a new important step in the direction of the social protection of all categories of our scientists and in weakening the trend toward the developing "brain drain" abroad.

But this problem worries all of us. We have actually been faced for the first time with, it can already be said, the mass exodus of scientists from academic institutes. This process thus far has not assumed a threatening nature, but recent data on the long-term departure abroad of scientists from leading institutes of the USSR Academy of Sciences are alarming: During last year 534 people went abroad from institutes of the USSR Academy of Sciences for long periods—from six months to three-five years; moreover, for the most part these are the most actively working scientists—doctors (22 percent) and candidates of sciences (46 percent), 12 percent are under the age of 30, 74 percent are from 30 to 45 years old. Of course, this is not only a loss, but in many cases also the acquisition of new knowledge, contacts, and ideas. However, a "brain drain" on a significant scale can weaken our science.

Now about contact with the republic academies. At a meeting at the Academy of Sciences of Belorussia the President of the country stressed once again that basic science is one of the most important spheres of statewide significance. We are also organizing our activity on this basis. On 20 September 1990 a conference with the participation of the presidents of the Academies of Sciences of 14 union republics, at which an agreement on the organization of the Council of Presidents as the highest consultative and coordinating organ for questions of science was signed, was held.

On 11 December of last year at a meeting of this council the principles of the formation of the basic research fund and the financing of science were discussed and approved and the attitude toward the establishment of republic budgetary basic research funds was specified. The most important questions of the life of the academies, particularly those connected with their interaction, as well as with the higher school, were discussed.

We must also specify our attitude toward the establishment of the Russian Soviet Federated Socialist Republic (RSFSR) Academy of Sciences. We are basing ourselves on the fact that the RSFSR Academy of Sciences will be organized in conformity with the suggestions expressed by us—as a scientific society that supplements the scientific potential of the USSR Academy of Sciences—and we are prepared to participate through our collectives in the elaboration of the basic problems and programs, which the RSFSR Academy of Sciences will put forward; we are prepared to strengthen ties with the higher educational institutions of Russia and to take part in the election of members of the Russian Academy of Sciences. We have sent a letter in this regard to the government of Russia.

A few words about the development of international contacts. The global nature of basic science, which does not have territorial and national boundaries, is facing us with the task of organizing new forms of international cooperation. Based on our experience, ties that are based on direct contacts of scientific organizations and individual scientists, as well as the establishment or participation in the establishment and work of international scientific centers are the most promising ones. In connection with this we are placing great hopes for the organization of permanent interaction among individual members of the world community of scientists and the sharing of basic and current scientific information on the Akademinform system, the first section of which, I have been told, is to be put into operation in the immediate future.

Now briefly about several scientific directions.

At present, at the moment of the acute crisis of our society, social scientists have come to be at the center of attention of the mass media. The names of many of them are not leaving the pages of the press. But this popularity is connected with the political activity of our colleagues; as to the scientific interpretation of issues, the crisis of the social sciences has not been overcome. I would indicate its three basic aspects:

- first, this is the crisis of the theoretical theses that are being expressed in various spheres of the social sciences. We have just begun the formation of the complex of sciences of man and the formation of a direction of the social sciences, which is new for us—political science;
- the second aspect of the crisis is the organizational aspect. The forms of work of social scientists have become obsolete, many social science institutes and subdivisions require reorganization. The textbooks and syllabuses and many names of social science disciplines have become obsolete;
- the third aspect of the crisis is the personnel aspect. Owing to the fact that social science as a scientific direction developed under particularly complex conditions, young people entered this field without particular desire, and in many cases the selection of scientists in this field was not the best.

I think that one of the general meetings should be specially devoted to the problems of economics and philosophy and should examine the effectiveness of the scientific work that is being performed within the framework of these directions, particularly on the level of the stimulation of cooperation with natural scientists. The presidium of the USSR Academy of Sciences has concluded that in this situation it is necessary to assign the performance of the duties of academician secretary of the Philosophy and Law Department to Vice President of the USSR Academy of Sciences Academician V. Kudryavtsev. It is also necessary to think about the reorganization of the institutes and subdivisions of social science institutions, first of all in the development

of new problems, which would reflect the needs of our society. But the restructuring of social science is the affair first of all of scientists themselves.

In speaking about the results in the area of the natural and technical sciences, I should note that the majority of results of a basic and applied nature were obtained within the framework of the fulfillment of academywide and departmental basic research programs, as well as state scientific and technical programs.

Inasmuch as the results of research are reflected in the reports presented to the general meeting, I will express views on just four directions that seem important for the entire Academy.

First of all it is necessary to indicate the research connected with ecology—with the elimination of the consequences of the Chernobyl accident. Great forces of the USSR Academy of Sciences and the academies of sciences of the Ukraine and Belorussia have been put to use here.

Moreover, scientific institutions of the Academy devoted much attention to the development of a model and algorithms of the database on the state of biological systems.

A system of the regular monitoring of regions of the world ocean was established for the first time. At present the monitoring system has been expanded by means of ecological information on the content of radionuclides in the atmosphere and organic contaminants and heavy metals in the ocean. It is important to note that other departments of the USSR Academy of Sciences and the republic academies have actively joined in ecological research.

Finally another result. On the basis of competitive projects concepts of the improvement of the overall ecological situation in the basins of the Aral Sea, the Volga and Neva Rivers, Lake Ladoga, and industrial centers of Siberia and Central Asia were formulated. The formulation of the concept of the organization and management of forestry in the basin of Lake Baykal should also be noted. But this is just the beginning of the major studies that we need to launch in this direction.

Now about the problem of global changes. The entire scientific community of the world posed this problem, it has been supported by the United Nations and the governments of many countries. The Spitak earthquake once again showed us how important the research in the area of earthquake prediction and the development of scientific principles of the prevention of damage from these natural disasters is. The International Institute of the Theory of Earthquake Prediction and Mathematical Geophysics has been established at the USSR Academy of Sciences. Together with the Institute of Earth Physics and other institutes of the USSR Academy of Sciences and the republic academies the implementation of the state program on seismic activity and the phenomena connected with it has begun.

The problem of the climate and its changes under the influence of natural and anthropogenic factors is the second most important problem of global changes. Here not only the development of theory, but also a vigorous comprehensive experiment with the use of space aids, permanent ground-based facilities, and biogeospheric stations are needed. The main problem here is to identify the true trends of the change of the climate of the planet and its individual regions and on this basis to develop a theory of the stability of the biosystem.

The third problem, which is also of a worldwide nature, is biotechnology, which is connected first of all with the production of food products and medicine. In speaking about genetics, I would like to recall that last year a large group of genetics scholars was awarded high state prizes for outstanding research. This is evidence of the recognition of not only the scientific services of the recipients, but also their persistence and civic courage in defending their scientific positions.

Finally, I would like to dwell on another problem that is directly connected with the economic development of our country—resource conservation. It requires the retooling of the entire national economy on the basis of the latest scientific ideas, principles, and technologies.

But, of course, as before power engineering should be the basis for the development of the national economy of the country. Therefore, the formulation of suggestions for the State Power Engineering Program and the strategy of the formation of the structure of power engineering on the basis of thermal electric, hydroelectric, and reliable nuclear electric power plants, as well as nontraditional sources of power are a task of vital importance.

Even this brief look at several directions of science shows how substantial and active the potential of our science and the programs of our research should be.

Marchuk Notes Policy Needs at USSR Academy of Sciences General Meeting

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[Report by A. Pokrovskiy on speech of President of the USSR Academy of Sciences G. Marchuk and report of Chief Scientific Secretary of the USSR Academy of Sciences Academician I. Marchuk at the annual general meeting of the USSR Academy of Sciences on 13 March 1991, under the rubric "Yesterday, Today, Tomorrow": "A National Resource of Perestroika. At the General Meeting of the USSR Academy of Sciences"—first paragraph is PRAVDA introduction]

[Text] Often we still complain of the slowness of the pace of perestroika. But let us look at the past years from today's perspective—irreversible changes have occurred in our political and social life, in the economy and science. Scientists regard as the boundary year for themselves 1990, when the importance of basic research in the development of modern society was particularly stressed

in the Ukase of the President of the country "On the Status of the USSR Academy of Sciences."

This document, as the participants in the annual general meeting of the USSR Academy of Sciences, which opened yesterday in Moscow, said, guarantees the conditions that are necessary for the successful fulfillment of the basic task of the academy—the attainment of the world level in the basic fields of science. In it the specific directions of the restructuring of the academy are specified, all the most important questions of its activity are touched upon.

In the past five years, President of the USSR Academy of Sciences G. Marchuk noted in his opening speech, in the activity of the academy the democratic principles were extended, the atmosphere of free scientific debates and creative inquiry was restored. The decentralization of the management of the activity of scientific institutions was begun, the rights of departments and institutes are being broadened. What actually corresponds to the internal logic of the self-development of science is becoming an integral part of the life of the scientific community. And at the same time science, as no other sphere, may prove to be vulnerable in case of the further intensification of the crisis. What is the reason for this vulnerability?

In modern society, even in case of the most liberal market economy, science grows deep into the tissue of the state organism, and its state is governed to a large degree by the situation in society. In any developed country science is regarded as a "national resource" and is in a priority position. But we should realize that during the transition period, before the new state and economic mechanism forms and stabilizes, a significant portion of the scientific institutions of the country will be in a difficult position. Our science is an integral system, and the decay of any part of it will inevitably affect the state of the entire scientific potential of the country. What should the role of the USSR Academy of Sciences be during this period?

The scientific potential of the USSR Academy of Sciences was formed by the efforts of the entire country and is the common property of the Soviet Union. We, the speaker noted, regard the academy as an important element of the state system and support the position of the USSR President, which is aimed at the consolidation of the renewed Union. In a few days a referendum will be held in the country. The USSR Academy of Sciences should address to all scientists of the country the appeal to say "yes" to the renewed Union.

The separateness of the academy and its independence from state and public structures, which are envisaged by the Ukase of the USSR President, undoubtedly make it possible to carry out our internal reforms in accordance with our own logic of development and the needs of scientific inquiry.

Now the time has come to specify clearly what meaning we should incorporate in the concept of the "democratization" of the management of science. Many people, I think, will agree that at the initial stage of perestroika we interpreted in a too simplified manner the concept of democratization, there was no in-depth conceptual understanding both at the academy and in all of society. This concept should include new approaches which would guarantee primary collectives the maximum freedom of scientific creativity. But every change of some mechanisms and relations, even if they seem hopelessly obsolete and archaic, must be accompanied by a prediction of the consequences. Without losing the traditions in the organization of science, it is necessary to strive to achieve mutual understanding between the young and older generations of scientists.

I believe, G. Marchuk noted further, that the need has arisen for the formulation of an integral concept of the independence of the academy, which envisages not only the internal mechanisms, but also questions of the effective interaction of the USSR Academy of Sciences with the academies of sciences of the republics, higher educational institutions, and all social and state structures of the country.

It is impossible not to see that the new relations are already now having an effect on the life of the academy. New institutes are emerging (about 20 during the year under review), the size of the majority of them does not exceed 50-60 associates, the number of joint ventures is increasing (there are now more than 50 of them), small enterprises are appearing, new structures are emerging within our traditional formations—the institutes.

The financing of the basic sciences is a very important issue. For 1991 the USSR Academy of Sciences is receiving base financing in the amount of 1.646 billion rubles [R], of them R416 million are for the regional departments. Moreover, R400 million have been allocated through the State Basic Research Fund. Besides this institutes and institutions can obtain additional financing for participation in the fulfillment of state scientific and technical programs.

The institutes of the USSR Academy of Sciences received quite a large amount of assets for the conducting of basic and applied research from a number of ministries and departments. However, now this item of revenues has decreased drastically. At the same time a large number of industrial associations and consortiums, which have considerable resources for the financing of science, have appeared. The prospects of cooperative with such organizations, including foreign organizations, should be studied.

At the same time the problem of the "brain drain" cannot but worry Soviet scientists. In recent years 534 people from institutes of the USSR Academy of Sciences have gone abroad for a long time—from six months to three-five years—moreover, for the most part these are the most actively working scientists. Of course, this is

not only a loss, but in many cases also the acquisition of new knowledge, contacts, and ideas. But the "brain drain" on a significant scale can weaken our science and break the links of its integration. On the basis of opinions, which were expressed by academy members, proposals of an organizational, legislative, material, and social nature on the creation of the conditions for our scientists were drawn up and sent to the government.

While speaking about the contact with the republic academies, the president of the USSR Academy of Sciences noted the need to define more precisely the interrelations with them under the conditions of the proclamation of the sovereignty of the republics. At a conference with the participation of the presidents of the academies of sciences of 14 republics an agreement on the organization of the Council of Presidents as the highest consultative and coordinating organ for questions of science was signed. Then at a meeting of this council the principles of the formation of the basic research fund were discussed and approved. This is one of the examples of how it is possible to come to an agreement within the entire Union.

As to the attitude toward the establishment of the Russian Soviet Federated Socialist Republic (RSFSR) Academy of Sciences, G. Marchuk said, as a scientific community which supplements the potential of the USSR Academy of Sciences, we are prepared to take part through our collectives in the elaboration of the basic problems and programs, which the RSFSR Academy of Sciences will advance.

Now, at the moment of the acute crisis of our society, the president of the USSR Academy of Sciences stressed, social scientists have come to be at the center of attention of the mass media. But this popularity is connected with the political activity of our colleagues. As to the scientific interpretation of the questions connected with the crisis of our society, its history, and the sociopsychological and economic aspects, here for the present there are more problems than achievements. The crisis of the social sciences has not been overcome.

Philosophers and economists need to set to work on the major and most urgent problems of the development of our society. This work should become the mainstay for the guidance of the country and all of society in the development of perestroika. One of the general meetings of the USSR Academy of Sciences should be specially devoted to problems of economics and philosophy, particularly on the level of the stimulation of cooperation with natural scientists.

While talking about the results in the area of the natural and technical sciences, the president noted that the majority of results of a basic and applied nature were obtained within the framework of the fulfillment of academywide and departmental basic research programs, as well as state scientific and technical programs. In scientific collectives of the natural science type of the academy research was conducted over a broad front,

numerous interesting results were obtained. This pertains to the departments of mathematics and the physical sciences, mechanics and information science, and power engineering, the chemical and biological departments, and the departments of the earth sciences.

First of all it is necessary to draw attention to the research connected with the elimination of the consequences of the Chernobyl accident. Large forces of the USSR Academy of Sciences and the academies of sciences of the Ukraine and Belorussia were put to work here. A program of joint actions on the evaluation of the consequences of the accident and of urgent basic studies of the region that suffered was developed.

The scientific institutions of the academy devoted much attention to the elaboration of the most important problems of environmental protection. The development of a model and algorithms of a database on the state of biological systems was a significant step in the direction of the accomplishment of this set of tasks. A system of the regular monitoring of regions of the world ocean was developed for the first time. At present it has been expanded by means of ecological information on the content of radionuclides in the atmosphere and organic contaminants and heavy metals in the ocean.

Concepts of the improvement of the overall ecological situation of the basins of the Aral Sea, the Volga and Neva Rivers, Lake Ladoga, and industrial centers of Siberia and Central Asia were developed by collectives of institutions of the USSR Academy of Sciences and the republic academies on the basis of competitive projects. The development of the concept of the organization and management of forestry in the basin of Lake Baykal should also be noted. But this is just the start of important research in this direction.

The Spitak earthquake in Armenia once again showed how important the research in the area of earthquake prediction and the development of the scientific principles of the prevention of damage from natural disasters is. An international institute of the theory of earthquake prediction and mathematical geophysics was established at the USSR Academy of Sciences. The implementation of a state program on seismicity and the phenomena connected with it was begun.

The change of the climate in response to natural and anthropogenic factors has become another most important global problem. Not only the formulation of a theory, which is being developed by the world scientific community, but also a vigorous comprehensive experiment with the use of space facilities, permanent ground installations, and biogeospheric stations are needed here. The main task here is to identify the certain trends of change of the climate of the planet and its individual regions and on this basis to develop a theory of biosphere stability.

Another problem of a general nature is biotechnology, which first of all is connected with the production of food products and with medicine. It is necessary to seek

new approaches to the obtaining of feed proteins, drugs, and a wide range of biologically active substances. Molecular biology and genetic engineering are serving as the foundation of this. Much has already been done here, but first of all research on the extracellular obtaining of protein and on problems of the human genome awaits its accomplishment. Both of these directions have been formed into special state programs.

The problem of resource conservation is also directly connected with the economic development of our country. It requires the retooling of the entire national economy on the basis of the latest scientific ideas, principles, and technologies. This is one of the basic technical means for quickly getting our country out of the economic crisis. We were late with the retooling of our national economy. It seems that the market is capable of giving a vigorous push to movement in this direction and scientists should be prepared for the acceptance of their basic ideas and commenced projects by the sphere of physical production.

But, of course, as before power engineering is the basis for the development of the national economy of the country. Therefore, the proposals on the State Power Engineering Program and the strategy of the formation of the structure of power engineering on the basis of thermal, hydroelectric, and reliable nuclear electric power plants, as well as nontraditional energy sources are a task of vital importance.

Even this brief look at several directions of science, G. Marchuk concluded his statement, shows how substantial and active the potential of our science and the programs of our research should be.

Then Academician I. Makarov, chief scientific secretary of the USSR Academy of Sciences, gave a report on the work of the presidium of the USSR Academy of Sciences and the fulfillment of the decisions of general meetings of the USSR Academy of Sciences during the period under review. He noted: For the academy it is particularly important that the Ukase of the USSR President on the status of the USSR Academy of Sciences specifies the basic parameters of the restructuring of its activity as a component of the socioeconomic organism of the country. Many questions of the implementation of the Ukase require decisions of the USSR Government. Drafts of decrees of the Cabinet of Ministers have been prepared on practically all such questions. Within the limits of its competence the presidium of the USSR Academy of Sciences in September of last year adopted a decree that contains a program of steps on the implementation of the provisions of the Ukase. They will be a discussion topic at the next general meeting of the academy, which it is proposed to hold in May of this year.

As a whole, I. Makarov noted, the farther the work on the fulfillment of the Ukase progresses, the more difficult the questions that are arising. It is now already clear that it is impossible to get by with the accomplishment of only

local tasks—the systems coordination of all directions of the work is required. It is a question in reality of a new policy in the development of basic science.

The democratization of the activity of the academy, the speaker said further, is naturally enhancing the role of the scientific community as a whole, particularly that of scientific councils and commissions for problems. Now the councils have begun to participate more actively in the evaluation of the results of scientific research, in the examination of projects and programs, in the preparation of the elections of members of the USSR Academy of Sciences, and in the settlement of other scientific organizational questions. However, still far from all the scientific councils, and there are more than 350 of them, are completely fulfilling their basic tasks. Meanwhile, precisely the councils, which represent not only academic, but also higher educational institution (VUZ) and sectorial science, can and should have a decisive influence on the development of basic research and provide objective recommendations on the priority directions and on the support of certain scientific collectives and individual scientists or others.

In speaking about the search for new forms of the organization of scientific collectives of the academy, including the management of large institutes and the establishment of associations, scientific centers, and international scientific institutions, I. Makarov noted that clear answers in these complicated and delicate questions, apparently, do not exist. Each specific case requires an individual approach. However, the problem of the management of science objectively exists, and this question requires careful discussion.

Last year so-called goal programs were the basic form of planning of basic science. The experience of the development of world science confirms the effectiveness of the management of basic research through the scientist and the influence on his interests and inclinations. If there is a scientist with specific qualities, there are also results. If there is no scientific leader, then, no matter how you plan, there will be no serious results. There is one conclusion: The absolutization of the possibilities of goal program planning, just as any other absolutization, is dangerous. It is important to maintain the proportions in the use of traditional and new mechanisms of the conducting of basic research.

In 1990 many scientific subdivisions of the academy were transformed. Thus, the Karelian and Kazan affiliates of the USSR Academy of Sciences became scientific centers. During the year 19 new research institutes and centers with the rights of institutes were organized, four of them are in the area of the social sciences and 15 are in the area of the natural and technical sciences.

However, there is also something here to think about. How justified is such a rapid increase of the number of new institutes, particularly given the increasing difficulties with the financing of the academy? Are the criteria of

"academicness" in the good sense of this word always high when establishing them?

In speaking about the new forms of the organization of science, one should also bear in mind the appearance of structural elements that are untraditional for the system of the USSR Academy of Sciences. At the academy 41 cooperatives and three small enterprises attached to scientific institutions with a total of 2,299 personnel and a wage fund of R10 million were established. Last year 13 joint ventures were organized, in their overwhelming majority with scientific production organizations of the United States. Many cooperatives gave a good account of themselves, giving assistance in research, the repair of equipment, and the maintenance of imported hardware.

The speaker spoke with alarm about the fact that the gap between the number of developments of institutes of the USSR Academy of Sciences and their introduction in the national economy is growing. But the high level of academic research under the conditions of the market economy may yield a significant economic impact. Yet this requires the extensive familiarization of specialists of the national economy with work of this sort. The initiative of departments and institutes should play the leading role here, while incentives from the obtained results should be a stimulus for this.

During the past year the cooperation of the USSR Academy of Sciences with scientific organizations of foreign countries underwent further development. The academy joined 11 new international organizations and is now a member of 235 organizations in practically all fields of modern science. Today 11 representatives of the USSR Academy of Sciences are presidents, 60 are vice presidents, and 84 are members of the general committees, executive committees, bureaus, and councils of these organizations. Our influence in the International Council of Scientific Unions (ICSU) has increased significantly. All this is convincing confirmation of the great international prestige of our academy.

In speaking about the work with personnel, the speaker particularly noted that the appeal of academic graduate studies is decreasing. This is due to the lack of proper working conditions, the small stipend, and the unsatisfactory everyday life of graduate students and young scientists. But the academy is interested precisely in talented young people.

The situation with the working conditions of scientific personnel remains difficult. The average area of work space per associate came at the beginning of 1990 to 2.9 square meters. At many institutions of the academy equipment is operated until it is worn out, labor discipline is decreasing.

Under such conditions it is particularly important to use the available assets efficiently. However, according to the results of 1990 more than R200 million, or nearly 20 percent of all the budget assets, were in the monetary funds of institutes. The establishment of Akadembank,

which operates on commercial terms, could become one of the means of the more efficient use of assets.

In connection with the transition to the market economy for the first time in the last 70 years a question has arisen with all urgency: How is one to preserve academic book publishing? There is one answer—only by having changed radically the principles of the interrelations between academic institutions and publishing houses. Not the size, but the scientific level of works should become the main criterion of the publication of scientific literature.

In the formed situation the reasonable reduction of the number of titles of scientific journals will contribute to the increase of their scientific level and to the reduction of the losses of the publishing house.

In the area of the material and technical supply of science 1990 was a difficult year for the academy. It was not included on the list of users, to whom resources were allocated in accordance with the line "the state order." Institutes need to evaluate realistically their financial and other possibilities in the acquisition of equipment and instruments. As a rule, the submitted orders for equipment, materials, and instruments considerably exceed the allocations earmarked for these goals. At the same time at institutes there are reserves of unused equipment and materials—more than R10 million worth.

In the "academic" difficulties scientific instruments hold a special place. At one time a scientific and technical association of the USSR Academy of Sciences, which began to produce these products, which the academy, the higher school, and other organizations need so much, was established. The decision of the government on the establishment on the basis of this scientific and technical association of the Scientific Instruments Joint-Stock Company, which withdrew from the academy, was made in May 1990. It appears that it has lost the capability to produce single-design instruments.

In concluding, the speaker again returned to the question of the academy as a self-managed independent organization. If you ask, he said, "has this situation become the actually prevailing one?" the answer should probably be: "Yes and no." The substantial increase of the wage of scientists has become a reality. The All-Union Basic Research Fund has been formed. The Council of Presidents of the Academies of Sciences is working. Many problems of the financing and material and technical supply of the USSR Academy of Sciences are being solved. The interference of state and other organs in the development of the basic sciences has certainly decreased.

On the other hand, much has to be done on the development of basic science, the increase of its role in the life of society, and the preservation of the prestige of the difficult work of the scientist. Here much depends on ourselves and on our activity, including in the social

field. We should achieve the realization by society of the fact that the activity of the USSR Academy of Sciences is an indispensable condition for preserving the intellectual potential of our society. For all the shortcomings that exist at the academy, and we clearly see them and are overcoming them, there is no other and there will be no other academy in the country.

The discussion of the report began at the evening session.

Major Research Programs Endangered by Union Breakup

917A0109A Moscow *RABOCHAYA TRIBUNA*
in Russian 13 Mar 91 p 1

[Article by Vice President of the USSR Academy of Sciences Academician Nikolay Laverov, USSR Deputy Prime Minister: "Only Together Are We Strong"]

[Text] It has been proven: It is possible to produce more and better only on the basis of scientific and technical achievements. Other means have not been found in the world. Miracles do not happen—with the technology of yesterday you will also remain in yesterday. And, it must be assumed, developed countries, and particularly those that have undertaken to restructure the economy, realized this. They relied and are relying on a strong state science and technology policy.

But on what force will we be able to count, if we do not preserve the Union? One now only has to break basic science up among the republics, and in five-seven years we will be hopelessly behind. Or should we take state scientific and technical programs?

I will cite just a few. "Promising Information Technologies" is the latest computers, which are capable of performing 1 trillion operations a second, and artificial intelligence systems, which are capable of evaluating even major socioeconomic projects. "Technologies, Machines, and Production of the Future" is the eight-to-tenfold increase of labor productivity. "The Latest Methods of Bioengineering" is drugs, food products, clean works. "High-Speed Ecologically Clean Transport" is the Center-South Mail Railway Line and magnetic suspension transport. "Ecologically Clean Power Engineering" is long-awaited nontraditional sources. It is also possible to continue further. But, I think, it is already clear: The republics are capable of solving all these problems only together. And there should be no illusions that any of them will manage on its own. Recall if only Chernobyl....

Yes, in the Ukraine there are high-class materials technologies and welders, in Belorussia there are high-class mathematicians, in the RSFSR there are high-class reactor engineers, and in Lithuania there are high-class heat engineers. But will they be able to do much without each other? Look, all of Europe is united around the Eureka programs. In science they do not compete—they cooperate. We are being invited. But we are the strong, the competent, and the able.

In other words, in raising the question of a strong state policy in the area of scientific and technical progress, it is necessary first of all to imply that without the integration of scientific forces, without their concentration on the decisive directions we will not advance. Indeed, it will also be difficult to catch up. Like in a motor vehicle, the wheels and screws of which, even if good, are scattered along the road.

CPSU Science, Education, Culture Commission Members Speak Out

917A0099A Moscow PRAVDA (2d edition) in Russian
2 Mar 91 p 4

[Report by V. Kerimov and A. Pokrovskiy on the regular meeting of the Commission of the CPSU Central Committee for Science, Education, and Culture under the rubric "On CPSU Policy in the Area of Science"; date and place not given: "The Units of Influence"—first two paragraphs are PRAVDA introduction]

[Text] As was already reported, the regular meeting of the Commission of the CPSU Central Committee for Science, Education, and Culture on the theme "On CPSU Policy in the Area of Science" has been held. Academician I.T. Frolov, commission chairman and member of the Politburo of the CPSU Central Committee, supervised its work. A package of laws on scientific activity was submitted for consideration by the commission.

CPSU Central Committee Member, USSR Deputy Prime Minister, and Chairman of the State Committee for Science and Technology Academician N.P. Laverov (an account of his report was published in the preceding issue of PRAVDA), Vice President of the USSR Academy of Sciences V.N. Kudryavtsev, and CPSU Central Committee Member and Head of the Humanities Department of the CPSU Central Committee V.V. Ryabov gave reports at the meeting. The materials of the meeting are published below.

I. Frolov

Our commission is taking a most active part in the drafting of the most important, we believe, laws on scientific activity.

The question of the legal support of scientific and technical progress has been raised for a long time by many scientists and now, under the new conditions of the transition to market relations, is acquiring extremely great importance. For it is a matter of creating the conditions for not only the survival, but also the development of science under the new conditions.

It is necessary to discuss the problem of science as a whole and in the interaction of the natural, technical, and social sciences and the humanities, the sciences of man. And our goal reduces to raising the status of science and scientific activity in our society, to raising the prestige of scientists and their role in general cultural

activity. The interaction of sciences and the cultural aspects of the development of science are now acquiring enormous importance throughout the world.

Now the interest in the general cultural aspects of scientific activity and, hence, in the coupling of science with other cultural values, first of all those represented in humanities directions and in culture as a whole, is growing not only among social scientists, but also among representatives of the technical and natural sciences.

The human dimension of scientific and technical progress is taken into account in the prepared draft laws. This is very important, because it is impossible to improve, for example, equipment in isolation from the study of man and his physical, psychological, and physiological qualities.

Our task is to consider the proposals on the legislative acts and on the key issues of the development of science with the reflection in them of the position of the CPSU. It seems necessary also to touch upon such questions as: the maintenance of the personnel potential of science during the transition period, the prospects of the development of the social sciences, the sociopolitical situation in the scientific community and the role of party organizations in the consolidation of scientists, the coordination of the legislative initiatives and the practical actions of the party as a whole and the Communist Parties of the union republics in the area of science, and the role of primary party organizations at higher educational institutions.

We will make here not some sort of standard decisions, which bind either the Academy of Sciences or state organs to something. From the very start we found the correct style of our interrelations with these entirely self-contained structures, which are absolutely independent of both the Central Committee and its commissions. Something, which at times is called the number of "units of influence," is left for us. We will try to increase these "units of influence." Only in this way is it possible today to pursue actively the policy of the ruling party in this area. Our decisions, of course, will consequently also have some sort of practical impact.

The commission of the CPSU Central Committee has specific, already established forms of activity with respect to science. Moreover, we are also seeking new forms. I am certain: We will find them on the path of the transformation of the party itself and its modernization. We will act so as to stimulate the development of our intellectual potential. If we are able to achieve this, then both the importance and the authority of the party among scientists will increase. Scientists will need it and, hence, our commission will have fulfilled its task.

V. Kudryavtsev

Dear comrades, what has been said here about the state of basic and applied research fully applies to the social sciences. They even require additional attention, if you consider, first, the crisis, in which social science was for

a number of decades, and, second, the intensified need for the use of the possibilities of the social sciences, which has been felt by our entire society, particularly in recent times. The status of social science is contradictory.

It must be taken into account that a nihilist attitude toward social science disciplines prevails in society. And I would say toward science in general, you are all well aware of this. You also know that many people are inclined to attribute to scientists, including social scientists, the shortcomings that exist in practice, for example, in the economy, in politics, and in ethnic relations.

On the other hand, the reassessment of the possibilities of science, when miraculous deliverance from all the difficulties of today is expected of it, is being observed.

It is also necessary to note here that the overall low level of mass consciousness is contributing to the spread of all sorts of superstitions, rumors, and unjustified expectations and to the popularization of ideas that in general are far from any science.

At the same time scientific knowledge is going unclaimed. Society, rather specific strata of it (including, unfortunately, also people who hold top-level positions) are rejecting and not claiming what it is possible to obtain from social scientists and are not using the really valuable thing that has been produced by science. The making of state decisions without reliance on science, be it reform in the area of the economy, the combating of crime, and others, is continuing.

Economists from the Academy of Sciences during the past year alone formulated a number of alternative scenarios of the development of the scientific and technical potential of the country. None of these versions, it must be said, was even considered by the Council of Ministers. Scientists there, they say, are making something up, this especially does not concern us.

Or here are the four draft laws on scientific activity. They were also prepared by legal scholars, moreover, a large portion of them were prepared not now, but five years ago. For five years all this lay about in the Council of Ministers, until N.P. Laverov activated the scientific staff of the State Committee for Science and Technology—at last they brought this draft up to its present state.

There is no gain saying everything that has been and is being done by social scientists, but I would especially like to dwell on the academywide scientific programs, one of them, "Man, Science, Society," directly corresponds to the main task of the day—to introduce in social life the principles of humanism, respect for the individual, and respect of his priority importance in all spheres of state and public activity.

Now there are no ideological obstacles for free creativity in the area of the social sciences—be it philosophy, history, jurisprudence, sociology, literary studies, and so

on. Things are being held up by old habits, by what they call the internal censor. And also by the lack of preparation for the in-depth study of life, for independent thinking, for the unbiased critical and, at the same time, deferential treatment of the views of others, which are hindering the development of science.

Although the main thing depends on scientists themselves, I want to say that social science also needs earnest support on the part of both state and party organs. First of all there is the question of financing. Of the entire budget of the USSR Academy of Sciences the social sciences last year accounted for 6-7 percent, approximately the same figure remains this year. Among humanities scholars, of course, the expenditures are less than in the technical sciences, no instruments are needed, various machines are not needed, but people need a wage and computerization is needed very much.

The question of the attitude toward scientists and toward scientific knowledge as a whole seems even more vital. Here the role of the party and party institutions would be of great importance.

The contact of party organizations with scientific institutions, unfortunately, is weak. Some vitalization occurred when commissions for various directions and problems were established in the CPSU Central Committee, but the work of the majority of them has stopped, and the social order of scientists has ceased to come.

The last thing that I want to say concerns the problem of the consolidation of all scientific personnel, the uniting of their forces in getting to know the laws of nature and society. I believe that two factors can be the basis for such consolidation. The first is the values common to all mankind, which the majority of scientists share, and here there is unity among representatives of the intellectual world. The second is professional affiliation with a group of scientific personnel, instructors, specialists of one type or another. Consolidation is needed in the scientific, intellectual, organizational, and political respects.

V. Ryabov

What is the place of the primary party organizations of institutions of science and higher educational institutions, what are the trends of their activity in the complex situation, which has already been spoken about here? It is well known that the influx into the party at academic institutes has practically ceased, a sharp decline of CPSU members among students is occurring. This is a consequence of the crisis, through which society and the party are going, and here the fate of the CPSU in the scientific community will depend on its capacity for positive initiatives in the sphere of science.

The activity of party organizations in settling everyday vital questions of one institution or another is one of the key issues in this process. The retreat of party organizations from all so-called economic, management, and other problems, which affect the fate of every worker, as

well as the evasion of the settlement of personnel questions in the form, which was observed earlier, did not lead to the elaboration of new methods of this work.

But the devising of programs of the socioeconomic development of collectives and the settlement of questions, which are connected with the proposal to them of long-range goals, are, undoubtedly, the affair of party organizations. In our opinion, through party groups in laboratories and scientific councils and through communist managers it would be possible to have a substantial influence on the sentiments of the entire collective.

It is a matter, in particular, of the constructive support on the part of party bureaus, party committees, and party organizations as a whole of new initiatives and new forms of the organization of scientific research, the support of the most talented scientists and capable young people. Party organizations, it seems to me, could state more actively their opinion on the proper placement of the emphases in case of the aspiration for the supercommercialization of scientific activity. The policy of the party organization of democratizing the life of the USSR Academy of Sciences in conformity with the basic principles, which were incorporated in the Ukase of the President, merits support.

Very much is now being said about the "brain drain." From the steps, which are being taken to solve this problem, scientific institutions and their collectives will judge the ability of the state and the party to ensure the dynamic development of science and the social protection of scientists under market conditions.

For the stepping up of the activity of party organizations at scientific institutions they should be actively involved in the discussion of the laws that will be considered by the Supreme Soviet. It would be worthwhile, I believe, for the committee to make the following decision: in the immediate future to organize a meeting of the secretaries of party organizations of scientific institutions and their directors, having also invited noncommunist directors, with the leadership of the CPSU Central Committee and to voice reciprocal claims, to come to an understanding about what we would like.

Our department with the participation of the leadership of the USSR Academy of Sciences and the USSR State Committee for Science and Technology three years ago came forward with the proposal to establish under the top leadership of the country a consultative council made up of the most prominent scientists of the country. In my opinion, this idea has not lost its topicality.

I must also state very earnestly my position with regard to the role of science in the preservation of the Union. The Presidium of the USSR Academy of Sciences has already signed an agreement with all the academies of the union republics. This testifies that the tendencies of scientists toward unification are very serious. Great possibilities for us to support the consolidation of the

scientific community and, on this basis, the consolidation of the republics in a new union of sovereign states lie here.

And in conclusion I would like to share the following thought. Perhaps, after today's discussion on behalf of the commission we should go to the Politburo with the suggestion that the party in conformity with the Resolution of the 28th CPSU Congress on science, education, and culture once again declare quite clearly and specifically its support of science and its role in the economic, political, and spiritual transformation of society. It is also necessary to agree to the investment of specific amounts on the part of the party for the training of young personnel of science.

The reports led to a lively exchange of opinions.

The time has come for the party to participate in the development of a new type of educational institutions, Chairman of the USSR State Committee for Public Education G. Yagodin noted in this statement. The question of establishing an ecology university is now being discussed.

It is also necessary to organize through party governing organs a large number of discussions. All the accusations, which are now forming among young people and are meant for departed and departing generations—this is intolerable. When designating black with black and white with white, one must not forget all the half-tones which lie between them. And I believe that if we would now talk honestly about the path of life, which our country has traversed, this would also benefit those who will come after us.

By passing the law on science, President of the Kazakh SSR Academy of Sciences U. Sultangazin said, we will first of all contribute to the legislative regulation of relations in this sphere. Today a large number of legislative acts have been passed, unfortunately, not all of them work.

If we want the law on science to begin to work properly under the conditions of the market economy, we must prepare a serious, clear draft law. We have received the four legislative acts being discussed. It is possible to take them as a basis, but as a whole it is impossible to pass them. In them there are many general phrases and much pretentiousness. This is more like a concept, like a program than like legislative standards.

The formulation of today's questions in the commission, President of the Ukrainian SSR Academy of Sciences B. Paton noted, is correct, well-founded, and interesting. The draft laws under consideration were prepared quite well, they contain progressive ideas and are interconsistent to a sufficient degree. It is necessary, of course, to discuss and polish them more, but even in such a form they already create a legal basis for the development of science. It is necessary on behalf of the commission to request the inclusion of the consideration of these draft laws in the plan of work of the USSR Supreme Soviet in

the shortest possible time. Nevertheless, it would be incorrect to reduce the entire matter just to these legislative initiatives. Unfortunately, the interests of science and of scientific and technical progress as a whole have in practice been completely ignored in several laws, which have already been passed or are being prepared.

For many scientific personnel, first of all for talented scientific personnel, the job in so-called scientific and technical cooperatives, various kinds of centers, associations, and the like is becoming the basic one. In comparison with them academic scientific institutions have been placed by the prevailing economic mechanism under the most unfavorable conditions. It is necessary, without waiting for the passage of the laws under discussion, also to strive for the making in the republics of the corresponding decisions, which strengthen the material foundations of science.

I want to draw the attention of those present, V. Shorin, chairman of the Committee for Science of the Russian Soviet Federated Socialist Republic (RSFSR) Supreme Soviet, stressed in his statement, to the fact that in the immediate future the concept of the organization of the Russian Academy of Sciences, in many respects an unusual concept, is being submitted to the verdict of the RSFSR Supreme Soviet. We are founding the Academy of Sciences without its own scientific institutions, believing that an academician can work anywhere.

Such a system will make it possible to solve successfully the problem of the interaction of the center and the republic, which is most important now for Russia, on the territory of which the USSR Academy of Sciences for the most part is located.

There are very many contradictory responses to this concept, but, it seems to us, it is of certain, even great interest, and the experience of implementing this project will show its vitality. Our basic hopes here are precisely in consolidation, which has been assigned to the academy.

Corresponding Member of the USSR Academy of Sciences K. Mikulskiy also spoke about the interaction of union scientific institutions with republic scientific institutions. Until now the cooperation of the center and the republic consisted in coordination on the basis of the differentiation of themes and the division of labor. Global and regional themes were thereby delimited. Considerably less attention was devoted to the cooperation of scientists. Now it is necessary to direct attention to consolidating the forces of scientists.

Here the motif of the social order of the party has been heard, the speaker continued. The weakening of the everyday working ties of the Central Committee with scientific personnel is actually being felt. Yes, the methods of management should be changed. But the social order of the party as the drawing of the attention of scientists to the most important questions for society—this undoubtedly should be a function of our party.

G. Shvetsov, chairman of the council of secretaries of party organizations of the Novosibirsk Scientific Center, noted that today all documents, which are issued on behalf of the CPSU, if they do not concern purely party affairs, attract close attention in society. People attempt to evaluate, first, how professionally these documents have been prepared and whether they are actually topical and, second, how far when preparing them the CPSU departed from the one-party approach.

Today, when the political confrontation in society is assuming dangerous dimensions, it seems extremely important to try when resolving them to seek consolidating approaches. The task of the commission is to engage in the elaboration of an independent program for its own social group.

Two serious questions of the organization of science require special attention, Academician V. Barsukov said in his statement. The land, on which scientific institutions are located, should be transferred to the jurisdiction of these institutions without any stipulations. As for taxes, why is it bad if scientific institutions, while performing their basic role, will manage to earn currency? Then the opportunity will appear for the purchase of advanced equipment, which is lacking in our country, or the organization of the production of new instruments. And everything that is spent on retooling should not be taxed.

Party organizations are seeking their own new place, which corresponds to the present multiparty situation, in the life of the collective, A. Popovich, chief of the Humanities Department of the Central Committee of the Communist Party of the Ukraine, noted. This process is a painful one, but already now is proceeding to the constructive stage. In a large number of collectives the party organizations are becoming a genuine bulwark of democracy, for our opposition forces when expatiating on democracy are very authoritarian, the dictatorship of narrow aggressive groups follows from them. The party organization should secure this responsibility for democracy. Further he said that the theme of the consideration of republic interests had not been developed in the proposed legislation.

I believe that in our decision, said Academician V. Matrosov, an adviser of the Commission of the CPSU Central Committee for Science, Education, and Culture, the following proposal should be included: The commission considers expedient the organization of basic comprehensive studies of the intersectoral problems of the steadiness and stabilization of the development of the country. It is recommended to prepare proposals on the establishment of a joint center of studies of the steadiness and stability of development.

Corresponding Member of the USSR Academy of Sciences N. Karlov, rector of the Moscow Physical Technical Institute, stressed: It is necessary for the humanities to find their worthy place in the laws being drafted. They are now becoming capital-intensive and cannot work

without the corresponding computer, information, and network support. Moreover, a section on the personnel support of scientific and technical progress is lacking in the text of the laws, which is being discussed. We have torn apart too violently the university, academic, and other sectors of science.

V. Gubarev, a member of the editorial board of PRAVDA, dwelt on the need for the closer cooperation of scientists and journalists. He proposed, in particular, on the basis of the Pravda Publishing House with the assistance of journalists of PRAVDA and the Association of Scientific Journalists of the country to publish series of weeklies, which would tell about the most different directions of modern science.

V. Kalashnikov, head of a chair of the Leningrad Electrical Engineering Institute, proposed to begin on the pages of PRAVDA a discussion of the scientific support of the new party program. In the course of the polemics, he believes, it is possible to increase the activity of the party organizations of higher educational institutions and scientific institutions.

I believe, said A. Tatarkin, acting director of the Ural Institute of Economics, that we should raise the question not only of the party devoting more attention to science and ensuring the financing of its individual directions. Now the party should itself also rely to a greater degree on science and scientific research. Under the conditions of the sharp increase of political trends only the party, which relies on science and scientific research, can aspire to the role of the ruling party.

I. Melnikov, secretary of the party committee of Leningrad State University, told about the work of the council of secretaries of party organizations of higher educational institutions of the country.

Concluding the discussion, I.T. Frolov noted that that the expressed interesting proposals would be taken into account in subsequent work, and specified the tactical goals and strategic priorities of party policy in the area of the development of the basic problems of science.

Laverov Reviews Central Government's Science Policy

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1 Mar 91 p 3

[Article by Academician N. Laverov, chairman of the USSR State Committee for Science and Technology: "Science Under the Conditions of Democracy. What Should Be Understood by a Strong Science and Technology Policy?"—first paragraph is PRAVDA introduction]

[Text] The experience of leading countries of the world convincingly demonstrates that the successful solution of social and economic problems is possible only on the basis of scientific and technical progress. Especially as during periods of radical structural reorganizations of

the economy an active state science and technology policy is mainly relied on. One should examine in precisely this context the resolution of the 28th CPSU Congress "On CPSU Policy in the Area of Education, Science, and Culture." In it the basic goals and principles of the activity of the party in the area of science are formulated and the task of formulating on the basis of these principles a new strong state policy in the area of science and technology, having linked it fundamentally with the economic and political reform being carried out, is posed.

If we speak very "broadly," a strong science and technology policy is the basic structural reorganization of the economy of the country on the basis of advanced technological capabilities of production, which is oriented toward man; the priority state support of basic research; the extensive use of economic levers of the stimulation of scientific and technical progress and the formation of a market of scientific and technical products; the creation of the conditions of the most favorable treatment of creative activity and the training of scientific personnel; the enhancement of the prestige of science and its role in society.

It is possible to do this only on the basis of the thoroughly developed legal support of the entire scientific innovation process.

The active all-union policy should be coordinated with republic and regional science and technology policy and should be pursued in the closest interaction of state and public organs of management. The pursuit of a unified state science and technology policy is especially important today, during the transition to a new type of union state and to an economy which is based on market relations, since under the conditions of financial and organizational instability and given the intensification of the aspiration for national autarky the real threat of the substantial weakening of the scientific and technical potential of the country is arising.

Such a policy should be based on the fact that under the conditions of the updated federation the union republics settle independently all questions of scientific and technical development, with the exception of those which they voluntarily turn over to union organs of administration. In particular, in consultation with the republics, it seems expedient to leave under the jurisdiction of the Union the formulation and the coordination of the practical implementation of the all-union strategy of scientific and technical development and the concentration of assets and intellectual forces in the priority directions of scientific and technical progress, which are equally important for all the republics.

The indicated principles of the formulation of science and technology policy have already begun to find their embodiment in the legislative and standard acts, which are being passed by the USSR Supreme Soviet, the USSR President, and the USSR Government.

The role of the legislative support of creative activity during the transition to the market economy both in the area of the protection of the rights of intellectual property and in the area of the social protection of the science worker is increasing particularly sharply. And here it is impossible to agree with the opinion, which exists at times, that competition and a market will automatically ensure scientific and technical progress and it is possible to do without state-public regulation of innovation processes first of all by means of lawmaking activity.

The first steps have already been taken in this direction. The Ukase of the USSR President "On the Status of the USSR Academy of Sciences" has been adopted. The draft of the USSR Law "On Scientific Intellectual Property and the Strengthening of Its Protection," a package of draft laws, which are connected with industrial property (on invention in the USSR, on production prototypes in the USSR, on trademarks and service marks in the USSR), and a number of other legislative acts and decrees of the government have been formulated. The government made the decision on the formation with the participation of interested foreign partners of the Nauka Insurance Society and an insurance pension fund of personnel of science.

However, today a more general legislative act—the Law on State Science and Technology Policy—is also absolutely essential. It has been prepared, has been submitted by the government to the USSR Supreme Soviet, and is under the consideration of its commissions and committees. Owing to its social significance this law, which has been submitted for approval to all the republics, after passage could play the role of a kind of constitution of the scientific and technical development of the country and become an important additional means of the consolidation and integration of scientists.

In case of market relations the passage of the USSR Law on Scientific Intellectual Property and the Strengthening of Its Protection is of greatest importance. For due to the fact that the legal protection of the creative activity of the scientist is lacking, the nonequivalent exchange between scientific research organizations and enterprises is increasing and the practice of the unsanctioned use of the results of research and development not only within the USSR, but also abroad is expanding.

The named drafts have been published and have been sent for consideration to ministries and departments and to the republics for initial examination by the scientific community. Then they will be finished up and submitted to the government.

Drafts of laws on the innovation enterprise, on scientific and technical information, and on the safety of operations in the area of genetic engineering and a number of other documents are also being prepared. I believe that it would be advisable in the future also to draw up the draft of a law on the academies of sciences. Such public organizations are now being established without thorough analysis and sufficient grounds. The urgent need

exists to specify the legal status of the academies. However, all this is just the beginning of the large amount of work, which still has to be performed on the full-fledged legal support of scientific and technical progress.

Taking into account the need for the further development of basic science and its protection under the conditions of the transition to the market economy, an all-union basic research fund is being formed. In accordance with the approval statute on the fund it is being formed mainly by means of allocations from the union budget. In 1991, 2.9 billion rubles [R] are envisaged for these purposes. Voluntary contributions of departments, enterprises, and individual people are also being received. A portion of the fund is being formed in freely convertible currency. It is planned to channel a large portion of the assets into the financing of basic research, which is being performed mainly in the system of the academy of sciences. It is planned to allocate about R400 million on the basis of the competition of proposed projects. During their selection the scientific community at large will be enlisted, the independent examination of the outlined research programs will be organized.

The introduction of a system of various types of research contracts in accordance with state scientific and technical programs, such as "High Energy Physics," "The Human Genome," "Thermonuclear Fusion," "Global Changes," and others, which require major capital investments of the state, should become another important source of the financing of basic science.

The introduction of the contract principle will make it possible to change over more quickly to payment not for the process of work, but for its results. However, the assimilation of the contract system in applied research and development requires the serious revision of the entire mechanism now in effect of financing scientific research institutes and design bureaus, as well as labor legislation and much more. It will not be possible to do this quickly, but it is possible to proceed to this. On 1 November 1990 the USSR State Committee for Labor and Social Problems and the USSR State Committee for Science and Technology at 16 scientific organizations of various ministries and departments began a legal experiment, as a result of which we hope to develop the basic principles of the contract system of the hiring of scientific personnel and the organization of basic research.

The establishment of special funds for the support of sectorial scientific research institutes and design bureaus, as well as basic research is an important source of the financing of applied science during the transition period. One should not forget one of the rules of scientific management—"in the atmosphere of basic science applied problems are solved well." The institutes of the system of sectorial academies (the All-Union Academy of Agricultural Sciences imeni V.I. Lenin, the USSR Academy of Medical Sciences, the Engineering Academy) and higher educational institutions could be the basis for the formation of such research structures.

The state support of individual most important directions of basic research through state scientific and technical programs in recent years has been increasing appreciably. In 1989 about R400 million were allocated for these purposes, in 1990 more than R550 million were allocated, this year R670 million have been allocated.

With respect to the basic research programs of the USSR Academy of Sciences the financing in the past five years has increased by nearly twofold. It is particularly important that the attention of the state to research in the humanities direction and in accordance with such programs as "Man, Science, Society," "The Scientific Principles of the Improvement of the Management of the Socialist Economy," and others has been increased.

Thus, if we succeed in using effectively all the assets being allocated by the country, we will realize one of the main provisions of the adopted Concept of the Improvement of the Management of Scientific and Technical Progress—we will ensure the priority development of basic research in the country.

The central direction in the formation and implementation of state policy in the area of science is the democratization of the activity of the scientific community. This is the utmost development of alternative approaches, contention, and competitive principles, demonopolization in the sphere of science, the extensive participation of scientists in the management of scientific and technical progress in the country and in the competitive distribution of resources through the branched system of scientific councils, the use of various forms of the examination of projects and programs, the formation of diverse public associations of scientists, the granting of independence to scientific collectives in the settlement of questions of their activity, the securing of the maximum possible creative freedom for the science worker, and the expansion of international ties.

Now these approaches are finding legislative expression. Thus, by the Ukase of the USSR President full independence was granted to the USSR Academy of Sciences. In conformity with it the thorough democratization of all the activity of the academy, which should find reflection in its new charter, lies ahead.

Along with state financial and legal support of basic and the most important applied research the organizational restructuring of the infrastructure of domestic science is necessary. Here I will distinguish two directions.

The first. A peculiarity of the historically established forms of the organization of basic research in the USSR is the separation of higher education from science. This is adversely affecting both science itself and the training of skilled personnel. Therefore, the processes of uniting academic and sectorial institutes and higher educational institutions into territorial scientific educational centers, technological universities, and other unified structures

should be stimulated. At the same time it is also necessary to support actively the formation of small innovation forms, which should become "incubators" of new technologies.

The second. Modern research activity is impossible without the appropriate sources of information. Unfortunately, the situation in the country with the information support of scientific and technical progress is not improving. This is a complex, multilevel problem.

Thus, for example, according to the estimates of specialists, only about one-third of the world scientific and technical information gets to the USSR. In the USSR there is on the average one journal for every 1,000 scientists (in the United States there is one for every 60 scientists). According to the estimates of scientologists, for a normally functioning society the norm is one journal for every 80-100 scientists. In order to change this situation and to form a modern information infrastructure of the country, it is proposed to formulate and implement a state program that is based on the achievements of modern information science.

In order to accomplish effectively the tasks of the leading development of basic research and to solve as a whole the problems of the acceleration of scientific and technical progress in our country, it is necessary to unite the efforts of state and public organizations, and first of all the CPSU as the ruling party, on this problem. As for the legislative initiatives of the CPSU in this area, now, it seems to me, the elaboration of any special additional draft laws on behalf of the CPSU Central Committee is not required.

Another thing is extremely important. The steadfast support and assistance of the CPSU Central Committee, USSR President and General Secretary of the CPSU Central Committee M.S. Gorbachev, and the people's deputies from the CPSU and the USSR Academy of Sciences in the quickest passage by the USSR Supreme Soviet of the elaborated drafts of the laws that concern scientific and technical progress are needed. The efficient work of all communist managers, regardless of what post they hold, as well as local party organizations on the implementation of the new approaches to innovation activity is necessary. I am convinced that only the systematic consistent implementation of a strong state science and technology policy will help us to intensify the economy and to improve fundamentally the life of the Soviet people.

The article was prepared on the basis of a report, which the author delivered at a meeting of the Commission of the CPSU Central Committee for Science, Education, and Culture.

Physics Institute Director on Problems of Basic Research

917A0127A Moscow *POISK in Russian* No 6 (92),
1-7 Feb 91 p 6

[Interview with Academician Andrey Borovik-Romanov, director of the Institute of Physical Problems of the USSR Academy of Sciences, by Mikhail Dubrovskiy, under the rubric "Point of View"; date and place not given: "Single-Handed Sailing"—first 11 paragraphs are *POISK* introduction; last five paragraphs are *POISK* conclusion]

[Text] A physicist is not only an occupation. This is a style of thinking.

I came to Andrey Borovik-Romanov, who is weighed down by numerous titles (academician! director!), with the intention to ask topical questions and to hear not less topical answers.

Well, for example: "What do you think of privileges?"

"Privileges, young man, are the plague of Soviet science...."

But I did not hear these words from Borovik-Romanov. I heard something completely different.

"Privileges for members of the Academy.... One order or ukase is not enough to abolish them. Society simply should change. Somewhere at Oxford it will not occur to anyone to acquire a special garage for high-paid professors, since it is no problem to buy a car...."

I am ashamed of myself. In my notebook there are all questions on a topical subject, which are often heard at meetings of the leading scientific community. I am wasting another person's time—there is not enough of it. I am disturbing his affairs—there are a lot of them. He is thinking about something else, while the dictating machine records his pauses and words. About what?

About science. About the fact that it is organized entirely wrong in our country. If he were a founder, he would probably say: "It has been turned upside down." But he is not a founder. He is a physicist.

"Shall we, perhaps, talk about this?"

"With pleasure!"

And he begins....

[Borovik-Romanov] ...I will stipulate: It will be a matter only of basic science and in this case just of so-called small-scale science—this is the field of research, in which such massive facilities as accelerators, reactors, space hardware, and other devices, at which the simultaneous participation of a large number of scientists and engineers of different types is necessary for obtaining results, are not used.

Once, when congratulating the theoretical physicists of his institute on a discovery, Petr Leonidovich Kapitsa compared the pursuit of science with a hunt. In the final analysis the main result of scientific work is a new idea, which at some instant originates in the brain of a scientist and is so similar to a successful shot! Of course, a new idea does not arise spontaneously. It is the fruit of lengthy research, at times many years of research. And just a handful of successful "shot" happen in an entire lifetime. But good hunting is needed for a successful hunt....

In our country two major mistakes were made at one time in the organization of basic science. First, they detached scientific research institutes from universities and, second, they set up excessively large institutes. The gigantic institute is complex hierarchical management: the director, deputies, scientific secretaries, heads of departments, laboratories, and sectors.... As a result a large number of prominent scientists spend their time not on hunting for an idea, but on minor administrative matters. But the main trouble is not even in this. The trouble is that the existence of multilevel scientific management paralyzes the initiative of young scientific associates. Moreover, in scientific creativity (as in any other creativity) the maximum freedom is needed. But the abundance of authorities, even liberal and benevolent authorities, restricts freedom. I have noticed this several times on the basis of the example of my own graduate students. In the majority of cases new, practical ideas occurred to them when I had gone somewhere for a long time. And this in spite of the fact that I am not at all a despotic man!

In the majority of western countries basic science for the most part is concentrated at universities. Such organization has obvious advantages. Professors and instructors are the leading scientists, who manage excellently equipped laboratories and conduct research at the leading edge of modern science. Undergraduates there from the first years come into direct contact with leading scientists. On the other hand, scientists can watch closely and select the most capable young people as students working for a degree and graduate students. The basic structural unit, in which "small-scale" basic science develops: the supervisor and three to five of his assistances from among undergraduates and graduate students, is formed in this way.

The selection of people for the permanent staff of an institute is the most important thing in the organization of basic science. This is the moment of parting of the pupil and the teacher. For the former should find his own direction in science and gradually form a new scientific unit, becoming surrounded by his own pupils. I remember a story which P.L. Kapitsa liked to relate—the story about how one of the graduate students of Rutherford after defending his dissertation came to his supervisor with a question about what he should now pursue. Rutherford replied resolutely: "Stop pursuing science!" The scientist has to accomplish the main task alone—to discover new phenomena and laws.

The staffing of an institute with creative scientific associates is a very difficult task. Of the enormous number of undergraduates and graduate students, who have taken instruction from any of the permanent scientific associates during his entire lifetime, it is possible to take on the permanent staff just one.

The problem of making up the staffs of institutes is directly connected with the problem of the job placement of undergraduates and graduate students. In the West it is solved more easily—because, on the one hand, the pursuit of basic science is not considered a very prestigious job and, on the other, there are many places in industry and business, where a broadly educated young person can find employment. In our country until most recently the wage at an institute, which conducts basic research, was at least not lower and often was higher than the average wage for the country. But there are not many "other" places—at applied institutes there is the eternal problem of "introduction," business is in its infancy, the occupation of school teacher or instructor at a provincial higher educational institution is also not very appealing. There is also another difficulty. In the West usually after defending his dissertation a young person often moves from one laboratory to another—they are located in different cities and often in different countries. We have the unsolvable problems of housing, residence registration, the job placement of one's wife....

Now a few words about how several of these problems were solved by Petr Leonidovich Kapitsa at the Institute of Physical Problems, which was established by him. In the number of permanent scientific associates this is the smallest among the physics institutes of the Academy of Sciences. There are only 50 scientific associates at it. Petr Leonidovich regarded as very dangerous the too rapid growth of any new institute. A scientific institute should grow slowly so that a unified collective with its own traditions would be formed. The question of young people was settled by a number of our leading scientists in the area of physics, chemical physics, and mechanics—P.L. Kapitsa, N.N. Semenov, S.A. Khristianovich, and others—by the establishment of the Moscow Physical Technical Institute, Fiztek. Its syllabus differs little from the university syllabus. The basic distinction of Fiztek from other higher educational institutions lies in the fact that a greater portion of the instructors at it are the holders of more than one job, they work on the staff of leading physics institutes of Moscow.

Beginning with the third year undergraduates of Fiztek spend a part of their time at leading physics institutes of Moscow, at which "base chairs" of this higher educational institution have been organized. At these "bases" lead associates of the institutes give lectures on special subjects to undergraduates. In the fifth and sixth years undergraduates spend practically all their time at the "bases" and complete a graduation project under the supervision of one of the associates of the institute.

At the Institute of Physical Problems, where I am the director, there is its own "base" chair, to which five to 10

undergraduates are admitted annually. About half of the graduates of Fiztek stay at the institute for another five years—two years as special students and three years as graduate students. If you add to them the 10-15 people, who have been attached from other institutes, it turns out that every "permanent" person has at least one young assistant. When the last year of graduate studies ends, the crucial time of selection for the permanent staff comes—of the three to six graduate students one has to choose just one.

The new permanent associate has equal rights with all the others—there should not be any administrative structures that subordinate him to anyone, except the board of directors.

It is natural that the director should know with what every associate is dealing. However, the basic form of monitoring of the scientific output of each of the scientists of the institute is debate during the discussion of the results of work. Petr Leonidovich Kapitsa was able over many years to create at the institute an atmosphere of the priority of scientific inquiry and creativity over all other questions of the life of the institute. This atmosphere determines the equality of all the scientific associates regardless of age and titles. Owing to the practical absence of rigid structures at the institute each of its associates can easily stop dealing with one theme and begin a new direction.

The spirit of freedom, which reigned and reigns at the institute, led during the times of Kapitsa to an amazing concentration of powerful scientific minds. The atmosphere of freedom is appealing! Only at a free scientific institution can an excellent moral climate exist and only there can only specialists of the highest skill—scientific associates, engineers, personnel of workshops...—work.

Andrey Borovik-Romanov is a happy man. Thirty years of work with the great Petr Kapitsa is a school, of which there is none better. After the death of Kapitsa he inherited the institute, in the work of which God forbid he should have changed, rationalized, improved, restructured something—he should just preserve carefully the traditions, at the sources of which was the genius. The work, which was chosen for him by the Creator, was his happiness. He said and says only what he thinks, and Borovik-Romanov thinks what he wants. The independence of thought for him is not so much a position as a professional necessity. For a scientist it cannot be otherwise.

Some time ago fate took him for a short time to one sectorial institute. And what do you suppose—even in this "exile" Borovik-Romanov found himself an ecological niche. A part of his time, true, was spent on "commitments"—work in the specialization of the institute, while the remaining hours were made available to his favorite physics. Even his circle of contact did not change—as he had circulated among the luminaries of scientific thought of the highest class, so he continued, having become a "sectorial man."

He also did not change in Kapitza's old leather armchair, in the office of the now world famous Institute of Physical Problems. He tried to spend less time on the administrative concerns of a director and more on science. True, with age it has become more difficult, there are many diverse and not very necessary meetings, various correspondents pester him.... What had Borovik-Romanov thought of? He had thought of taking leave of the chair and the position. If they interfere with my work, to hell with the altogether. He is now preparing to turn affairs over to his successor....

Life in science, according to Borovik-Romanov, only in science, and nowhere else—this is happiness. That is why he does not understand very well current scientific associates, who rushed with excitement to establish various alternative unions and associations. Of course, the existence of an alternative is a good thing. But for Borovik-Romanov those people, who agree to exchange truly scientific activity for gratification, which, though alternative, is still minor gratification, are slightly suspect.

A physicist is not only a style of thinking. A physicist is a way of life.

Science Official Criticizes Wage Contract System for S&T Workers

917A0126A Moscow *RADIKAL* in Russian No 5, Dec 90 p 6

[Article by Andrey Kulagin, chief of the Public Education and Science Department of the USSR State Committee for Labor and Social Problems: "Quo Vadis. The Process Is More Important Than the Result"—first two paragraphs are *RADIKAL* introduction]

[Text] Andrey Kulagin, chief of the Public Education and Science Department of the USSR State Committee for Labor and Social Problems, examines the problem of contracts and the social problems connected with it on the basis of the example of science personnel.

The contract form of the hiring of personnel and the remuneration of their labor, about which they have been talking a long time and nervously in the smoking rooms of institutes, is entirely capable (if adopted) of destroying our own system of work, where, according to the formula of Mikhail Zhvanetskiy, the process is more important than the result.

"Ninety-five percent of the mathematics is done by 5 percent of the mathematicians, while the remaining 95 percent of the mathematicians do 5 percent of the mathematics." The author of this pun was not that far from the truth.

The estimates of specialists in scientometry and sociologists show that the share of "generators of ideas" at scientific organizations is 8-10 percent. It is interesting that the share of works, which exceed the world level, as

a whole for scientific, design, and technological organizations also came in 1989 to 9 percent. Is it a chance coincidence?

The administrative departmental approach interferes with the development of high-class scientific research. The administration of the scientific organization manages the assets that have been allocated for research and development. Precisely it is the intermediary between the scientist (designer, process engineer, planner) and the client.

Placed itself within a quite rigid framework (by the prevailing schedule of salaries, the system of taxation, departmental subordination, and so forth), the administration imposes "the terms of the game" on the science worker.

During the work the performer is hampered by the limitedness of technical resources, a specific daily routine, and a large number of other conventionalities. The most regrettable thing is that the administration can change decisions during the work and the specialist is not always certain that they will allow him to complete this work. But the administration also does not have guarantees that at the height of the work the performer will not suddenly give notice. Today this is very topical in connection with the forthcoming opening of the borders.

The two main goals of the changeover to a contract are seen in, first, liberating the creative worker as much as possible, having granted the supervisor of the work extensive rights in the selection of personnel, the determination of the amount of the remuneration of labor, and the shifting of resources.

Second, the contract specifies the mutual rights and obligations of personnel and the organization.

Contract forms of the hiring and remuneration of personnel are widespread in developed countries, but it is impossible to transfer the experience of these countries directly to our soil. There are three basic reasons: the substantial difference in the rights of the natural person and the legal entity, the existence—in our country—of two types of money (cash and noncash), and, finally, the lack of a clear-cut set of social guarantees for the worker.

There is also a fourth one which already today prevents the use of the experience of developed countries. This is the lack of psychological preparation of the scientific community and all of society as a whole. Imagine that, while working under a contract, a person earned an amount sufficient not to work anywhere for two-three years. How would one's associates look at this?

In short, for the present we are not ready for the switch to a contract system in science. And here is why.

The first condition is the right of the conclusion of a contract for the performance of jobs by any client and any collective, bypassing all intermediaries. I particularly want to stress—by any client: an innovation fund, a scientific research institute, a design bureau, a plant, a

kolkhoz, a cooperative, a farm, a public organization, and, finally, a private person.

Now in essence only the scientific organization has the right to hire scientific personnel. The granting of this right to any client in a short time will lead to the bankruptcy of the majority of scientific organizations, first of all sectorial organizations. Hence, 1.5-2 million people may be freed. While under the conditions of the mass transition to the market economy and, consequently, the mass freeing of personnel this is an additional army of unemployed.

The second condition is the unconditional right of the client to choose a performer. For the client wants to obtain and is will to pay for not the process of work, but namely its result.

Here there is a very essential thing: We are switching from the principle "payment for labor" to the principle "payment for the result."

But the implementation of precisely this principle in the system of cooperatives led to the mass discontent of the population with "disproportionately large" wages.

The third condition. After the performer has been specified and an understanding has been reached on the time and cost of the work, on its technical and economic parameters, and on other necessary elements of the contract, the performer independently determines the entire course of the work.

He should have the right to enlist the necessary specialists for the entire term of the contract or for part of it; to specify in full for them specific assignments; should have the right at any time to part with a participant in the work, who is not ensuring the necessary result; to specify the schedule of the workday. Finally, he should have the right to specify individually the amount of the reward of the worker.

In other words, within the contract collective the responsible performer (he is the supervisor of the work) exercises practically complete dictatorial power. No trade unions, party committees, councils of the labor collective, and so on should have the right to interfere in his work. (Does it not seem to you that all this is somewhat at variance with the present appeals for democratization?)

It must be said that under present conditions it is practically impossible to implement each of the listed rights of the supervisor of the work.

We do not have a labor market, it is difficult to realize the freedom of choice of the work; standard labor regulations, which should be observed, are in effect. And so on and so forth.

The fourth condition. Materials, equipment, premises, electric power, and so forth are necessary for the performance of work.

It is clear that for the performance of a separate job under contract it does not make sense to acquire expensive scientific equipment. Apparently, some sort of rental offices are needed. But it is even better simply to "buy" time on such equipment, as computer time is now bought.

The same thing also goes for premises.

The fifth condition. The system of social guarantees and social security of personnel formed over the course of 70 years. Under the conditions of the market economy in general and particularly in temporary contract collectives the prevailing system is ineffective.

For example, Article 34 of the Russian Soviet Federated Socialist Republic (RSFSR) Labor Code grants specific categories of citizens the privileges of remaining on the job in case of the reduction of the number or staff of personnel. If this worker is not needed, but we are forced to keep him, who will pay the additional expenses?

Moreover, the contract system increases excessively the dependence of the worker on the employer. Let us imagine, for example, that the contract with a specialist expires on 1 January, at the enterprise he is in line for housing, but they are turning over a new building only in February.

The opportunity to obtain an apartment also actually depends on whether a new contract will be concluded. (But if the nephew of the director is in line for housing right behind this worker, it is not difficult to guess the actions of the director.)

In short, a completely new system of social guarantees, which is based on new principles, is needed.

And it is even not a matter of the revision of some enforceable enactments. On the one hand, a full-fledged market of apartments, travel authorizations, motor vehicles, and so on and, on the other, specific institutions of protection, such as associations of scientific personnel (like the union of composers) and insurance funds, are necessary.

Let us draw conclusions.

The introduction of the contract system in science requires the radical revision of the entire prevailing mechanism of its financing and functioning and the prevailing labor legislation.

It is practically impossible to switch entirely to the contract system now or even in the immediate future. This, if you wish, is a distant goal. But it is possible to narrow the task and to set a goal that is attainable under our conditions.

It is possible already now to introduce some elements of the individual contract. In particular, prevailing labor legislation envisages the possibility of the conclusion of a labor agreement with a worker for the time of the

performance of a specific job. In principle no one interferes, when concluding such an agreement, with the precise specification of the terms of the performance of the job and all other necessary questions. In essence this will be almost a contract.

Just a sufficiently clear internal statute, which is approved by the director of the organization and the trade union committee, is needed for this, for example, in science. The consent of the superior organ of management is not required for this.

At many organizations they are now studying the problem of contracting. The trouble is that the majority cannot independently draft the corresponding legally and economically competent statute. As a result a large number of low-quality developments, which they are still trying to sell, have appeared.

It is possible to group with the most frequently encountered mistakes the legal tactlessness of the documents, which worsen the legal and social protection of the worker as compared with prevailing legislation, the

excessively rigid regulation of the activity of contract collectives or, on the contrary, their excessive freedom, which, undoubtedly, is accompanied by the significant increase of the economic risk of the employing organization.

A quite successful attempt at the drafting of procedural materials on contracts was made in Vladimir (telephone number: 92-956) at the cost accounting Regional Sectorial Consultation Center of the USSR State Committee for Science and Technology.

From the editorial office: Given the completely obvious need for a contract system there are more than enough difficulties in its introduction. In connection with this the USSR State Committee for Labor and Social Problems is beginning an experiment on the hiring and remuneration of the labor of personnel of scientific organizations on the basis of contracts.

We will follow the course of the experiment and, of course, will tell about the results.

Innovation Bank Fails To Meet Expectations

917A0116A Moscow IZVESTIYA (Union edition)
in Russian 10 Apr 91 p 2

[Article by IZVESTIYA science commentator B. Konov-
alov: "Money for Taking Risks"]

[Text] The future should be laid in the present. It is necessary to water and fertilize any new scientific and technical idea like the seedling of a fruit tree, so that it would grow and bear fruit. A year ago the USSR Council of Ministers adopted a decision on the establishment of an organization, for which care for and concern about new scientific and technical ideas became a professional matter. Its name is the Innovation Fund attached to the USSR State Committee for Science and Technology (GKNT).

At one time it was believed that innovation banks, quite a large number of which had appeared in the country, would be able to fulfill this duty successfully. But, alas...the hopes placed in them were not justified. It is necessary to cultivate a development for two-three years, and there is always the risk that it will prove to be unsuccessful. But the founders and stockholders of innovation banks, of course, want to have good dividends, and preferably in a year. Therefore, they have, in essence, turned into purely commercial banks.

The fund is not a bank, but a financial organization, which uses various terms and methods of financing for the support of promising scientific developments. The basic criteria of the choice of a financed development are its novelty, originality, and national economic significance.

When determining the methods of financing the Innovation Fund approaches each project individually. In some cases it abides by the rules of the market and makes monetary assets available on commercial terms, on the basis of existing bank interest rates. In others financing is possible only on the terms of the return of the invested assets or with the minimum interest.

"The Innovation Fund," Deputy Chairman of the USSR State Committee for Science and Technology V.A. Mikhaylov stresses, "is one of the tools of the implementation of science and technology policy in the country and one of the flexible sources of financing. It relies on the possibilities of the USSR State Committee for Science and Technology in questions of the choice and examination of proposed developments and on the use of our information base."

For the present the assets of the fund are not very great, but it is already financing more than 10 projects and intends to support the establishment in the country of new technology parks.

The nontraditional nature of the Innovation Fund also appeared in the fact that it decided to establish small enterprises for the implementation of financed technologies. For example, the Innovation Fund established in

Kuybyshev the Technology Center headed by A.V. Popov for the development of an entire range of new methods of processing materials. Moreover, the Innovation Fund established the Ellina Society with fundamental responsibility, which conducts its activity in the area of the production of new materials for the electronics and electrical equipment industry. The Innovation Fund, having the right of foreign economic activity, is contributing to the introduction of domestic science-intensive products and developments abroad.

For the consideration of the question of financing the authors of developments need to submit a brief feasibility study. As a rule, the time of the recovery of investments should not exceed three years, while the profitability should not be less than the average profitability for the corresponding sector of the national economy.

"At present," Academician N.P. Lyakishev, chairman of the council of the Innovation Fund, and General Director V.A. Dyukarev say, "a network of affiliates and departments is being established in the country. Republic departments have already been established in Kazakhstan and the Ukraine, an affiliate has been established in the Leningrad Economic Region."

Agricultural Scientists Protest Self-Financing Reforms

917A0115A Moscow PRAVDA (2d edition) in Russian
2 Apr 91 p 2

[Letter to the editor of PRAVDA: "Another Crushing Defeat? Domestic Selection Science Has Found Itself on the Verge of Collapse"—first paragraph is PRAVDA introduction]

[Text] At the height of spring the hardened problems and troubles of our agriculture are once again being felt more and more concretely. For yet another year a shortage of everything—from chemicals to seeds—is again in store. But the fuller the flow of reports on these themes is, the more obvious it is: It is not a matter of someone's personal omissions and miscalculations. The entire system of the functioning of the agroindustrial complex has fallen into decay. And it is possible to restore it only from the ground up. Today we are publishing the letter of a large group of breeding experts, academicians of the USSR Academy of Sciences and the All-Union Academy of Agricultural Sciences imeni V.I. Lenin, doctors of sciences, and directors of subdivisions of agricultural science.

In the solution of the food problem an enormous role belongs to plant and strain resources. Good strains and seeds, as is known, can provide a 50-percent increase of the yield. Several generations of prominent domestic breeders worked on the development of high-quality strains and hybrids of all crops, the potential yield of which is not inferior to the best world specimens. Prominent breeders of the country—Michurin, Shekhurdin,

Konstantinov, Lisitsyn, Yuryev, Lukyanenko, Pustovoyt, Remeslo, Alsmik, Lorkh, Yakovlev, Khadzhinov—achieved in their creative work phenomenal, world famous results. By the efforts of Academician N.I. Vavilov and scientists of the All-Union Institute of Plant Growing and other scientific institutions in the USSR the most abundant genetic stock of plants was established and large stocks of completed theoretical research in breeding were developed. On their basis fundamentally new hybrid and transgenic strains, which genetically are more resistant to pests, diseases, and stress factors of the environment, may be obtained in the next few years, which will make it possible to decrease sharply the use of pesticides and to improve significantly the ecological situation in agroindustrial production. For these purposes 53 breeding centers have been established and are operating in the country.

The indicated strategic direction was made the basis for current and long-range breeding programs. For their implementation the All-Union Academy of Agricultural Sciences imeni V.I. Lenin together with the State Committee for Science and Technology, the USSR Academy of Sciences, and the All-Union Society of Geneticists and Breeders has launched work on the reinforcement of breeding centers with skilled personnel and advanced instruments, equipment, and machinery. Particular attention is being devoted here to the training of specialists in the field of genetics, breeding, and biotechnology both within the country and abroad.

As a result of the taken steps in recent years it has been possible to solve a number of fundamentally important problems in the field of breeding. To develop nonlodging strains and hybrids of cereals with a potential yield of 10-15 tons per hectare. To produce strains of cereal, leguminous, fruit, vegetable, technical, and other crops, which are resistant to dangerous diseases, nonshattering strains of peas, hardy strains of soft and durum wheat, and others.

Today spartanka and olimpiya-2 of the Krasnodar Scientific Research Institute of Agriculture imeni P.P. Lukyanenko with a potential productivity of more than 10 tons per hectare, donskaya polukarlikovaya, donskaya bezostaya, and Don-85 of the Donskoye Breeding Center, the tselinnaya yubileynaya, omskaya-17, and saratovskaya-55 strains of spring soft wheat, which were bred by the All-Union Scientific Research Institute of Grain Economy, the Siberian Scientific Research Institute of Agriculture, and the Scientific Research Institute of Agriculture of the Southeast, and the strains of turgid and durum spring and winter wheat, which were bred by the Scientific Research Institute of Agriculture of the Southeast, the Donskoye Breeding Center, and the All-Union Breeding and Genetics Institute, hold a special place among the new strong strains of winter wheat.

However, a strong blow has been dealt to the creativity of scientists and to the effectiveness of breeding—breeding institutions have been converted to cost accounting and self-financing. The state of affairs here

has worsened significantly. Due to the shortage of budget financing breeders have been forced to earn nearly half of the assets for their scientific activity through nonspecialized contracts with enterprises, sharply reducing the scale and intensity of the creative process in the basic directions. The situation has been further complicated by the fact that the delivery of breeding and seed-growing equipment and advanced instruments and machinery, which are not produced in our country and previously were purchased abroad, has practically been halted.

In contrast to many countries, in our country the rights of breeders and their achievements thus far are not protected by the appropriate legal legislative acts. The prestige of such activity under these conditions has decreased drastically. All this can lead in the next five-six years to the loss of basic achievements and to the sharp decrease of the effectiveness of domestic breeding.

The settlement of the question of the changeover of all breeding research and the genetic, biotechnological, and other theoretical research, which is connected with it, to full budget financing, as is done in other countries, is the main thing which must not be delayed. For this it will be necessary to allocate an additional 150-200 million rubles annually, which comes to less than 5-6 percent of the value of the increase of the yield that is obtained by agricultural enterprises owing to new strains and hybrids.

In the formed situation the USSR Cabinet of Ministers and the Councils of Ministers of the union republics, in our opinion, need already this year to adopt a decision on the transfer to breeding institutions for the stimulation of the labor of scientists and the strengthening of the material and technical base of institutes of not less than 30 percent of the cost of seeds and planting stock of the highest reproductions regardless of what farms sell them. This step is extremely important during the transition period to market relations, when it is still impossible to introduce everywhere contract prices for seeds and planting stock of new strains and hybrids.

Purchases of the latest breeding and seed-growing equipment, particularly harvesting equipment, as well as instruments and machinery abroad should be made in the shortest time, breeding centers and strain testing stations and plots should be equipped with them, and at the same time their production in the country should be organized in order to abandon subsequently their importing.

The development of breeding is closely connected with the devising of new methods, particularly on the basis of genetic and biotechnological research. However, the indicated directions have not kept pace with development in the country since the devastation of genetics in the recent past, as well as due to their extremely poor financial, material, and technical support on the part of the state and the republic governments. To overcome the lag the USSR State Committee for Science and Technology, the USSR Academy of Sciences, the All-Union

Academy of Agricultural Sciences imeni V.I. Lenin, the USSR Ministry of the Medical Industry, and other departments of the country together with the academies of sciences of the republics and the corresponding republic departments prepared and submitted to the USSR State Planning Committee a draft of the National Interdepartmental Program on the Development of Biotechnology During 1991-2000. It is extremely important for the USSR Cabinet of Ministers and the Councils of Ministers of the republics to consider and approve it as quickly as possible.

For the purposes of protecting the copyrights of breeders and their achievements the All-Union Academy of Agricultural Sciences imeni V.I. Lenin together with the State Commission for Food and Purchases of the USSR Council of Ministers, the USSR State Committee for Inventions and Discoveries, and other departments prepared the draft of a USSR law on this question. Now it is necessary to expedite the advance and passage of this important document by the USSR Supreme Soviet.

We are confident that the timely solution of the indicated problems will change the situation in breeding of the country for the better.

[Signed] V. Shevelukha, G. Muromtsev, E. Nettevich, G. Gulyayev, A. Sozinov, I. Shatilov, G. Kazmin, V. Zubeiko, V. Dragavtsev, N. Turbin, I. Kalinenko, V. Strunnikov, Yu. Puchkov, Yu. Konovalov, P. Goncharov, S. Shetakov, Ye. Aleshin, B. Guryev, S. Dzhanev, O. Khorikov, S. Biryukov, L. Zhivotkov

Discussions End on Contract Pay for S&T Workers

917A0117A Moscow POISK in Russian No 10 (96),
1-7 Mar 91 p 1

[Interview with Igor Yelin, deputy chief of a division of the Main Economic Planning Department of the USSR Academy of Sciences, by POISK correspondent Vladimir Shlemin, under the rubric "What Is Science To Be Like?"; date and place not given: "Contracts for Volunteers"—first paragraph is POISK introduction]

[Text] In a few days the period of the discussion of "The Model Statute on the Organization and Remuneration of the Labor of Personnel on the Basis of Individual Contracts," which was drafted by the USSR State Committee

for Labor and Social Problems and the USSR State Committee for Science and Technology, expires. While beginning with the second half of this year it is proposed to introduce the contract system at scientific organizations of the USSR Academy of Sciences. Our correspondent Vladimir Shlemin asked Igor Yelin, deputy chief of a division of the Main Economic Planning Department of the USSR Academy of Sciences, to comment on the situation.

[Yelin] "The Model Statute" of the USSR State Committee for Labor and Social Problems and the USSR State Committee for Science and Technology, which is undergoing examination today at a number of scientific research organizations of the country, will become the basis of the proposed system at the USSR Academy of Sciences. Institutions of the Academy of Sciences are also among them. These are the Physics Institute of the USSR Academy of Sciences, the Institute of Problems of the Safe Development of Atomic Power Engineering, as well as the Engineering Center of Biotechnologies.

The statute has already been sent to all institutes and scientific research organizations for discussion in the labor collectives. We intend to receive and analyze the remarks and suggestions by 15 March. The most constructive and fruitful ones will be taken into account when drafting our, the academy's, statute.

It will be approved in the State Committee for Science and Technology and the State Committee for Labor and Social Problems and by the beginning of the second half of the year will be proposed to all academic organizations.

[Shlemin] Does this mean that institutes will be obliged to switch to the contract system?

[Yelin] On no account. The institutes are free to choose the forms of the contract system, but can also reject it altogether. Moreover, every scientific associate has the full right, as before, to continue work under a permanent labor contract.

[Shlemin] For whom is the contract system intended?

[Yelin] First of all for young, most energetic scientific personnel. The contract system will enable them to obtain great freedom of creative activity and, by agreement with the administration, a higher level of the remuneration of labor.

Functions of New USSR Academy of Sciences Commission for Property

91740122A Moscow *POISK* in Russian No 12 (98),
15-21 Mar 91 p 9

[Interview with Vice President of the USSR Academy of Sciences Academician Oleg Matveyevich Nefedov, chairman of the Commission for Property of the USSR Academy of Sciences, by *POISK* special correspondent Vladimir Shlemin; date and place not given: "The Right to the Future"—first two paragraphs are *POISK* introduction]

[Text] By the ukase of the USSR President the Academy of Sciences of the country was declared the owner of all the property that to this day is at its use. But the Academy is not only the presidium and even not the general meeting. This is tens of thousands of scientific associates and hundreds of institutes, laboratories, enterprises, and organizations, by whose joint efforts the material base of basic research was created. How is one to make the existing wealth accessible to everyone and at the same time to preserve and protect it for efficient use?

At the annual meeting of the USSR Academy of Sciences Vice President Academician Oleg Nefedov, chairman of the Commission for Property, spoke about this. Our special correspondent Vladimir Shlemin met with the academician and asked him to comment on the situation.

[Shlemin] Oleg Matveyevich, first of all a few words about the tasks that have been set for the commission.

[Nefedov] The Commission for Property of the Academy was established by a decree of the presidium of the Academy of Sciences to execute the ukase of the USSR President. Its nearly 40 members represent the scientific community of various regions of the country. These are academicians, corresponding members, doctors and candidates of sciences, and representatives of public organizations and various subdivisions of the USSR Academy of Sciences.

Our main task is to propose a reasonable concept of the fundamental principles of the right of ownership of the USSR Academy of Sciences.

Moreover, we are preparing proposals for the decree of the USSR Cabinet of Ministers "On the Status, Property, and Assets of the USSR Academy of Sciences" in the area of ownership, as well as are performing inventory work.

[Shlemin] What has been done today?

[Nefedov] We have prepared, as they say, in the first reading a package of documents on these questions. Upon completion of a detailed analysis they will be proposed for inclusion in the new charter of the Academy of Sciences as an integral part of it, which secures the rights of ownership of the Academy and its institutions and organization. Moreover, we have come to the conclusion of the need for the drafting and passage

by the USSR Supreme Soviet of the USSR Law on the Academy of Sciences, in which the questions being discussed should also find reflection.

[Shlemin] What do the principles of the owning of the property of the Academy seem like to you?

[Nefedov] First of all, the new situation should not create any inconveniences both for the scientist and for the community as a whole. In other words, the scientific associate should not be faced with any problems in work due to the change of the subject of ownership. We are obliged to guarantee him the same free access to equipment and laboratories as at the time when the property and assets belonged directly to the state. At the same time the property should be in the hands of those, who are capable of keeping it in proper order and of ensuring its most efficient use in the interests of science and in the interests of the entire scientific community. Thus, major installations and structures: observatories and accelerators, for example, should remain academy-wide property.

The Academy of Sciences should also retain in its exclusive ownership academywide fixed capital, the infrastructure, and institutions of the social sphere of the USSR Academy of Sciences. These objects—and the list of them should be established by the general meeting—under no conditions should be alienated or transferred to the ownership of other organizations.

It is necessary to speak separately about our territorial formations. We believe that the fixed capital and other property, which is in the use of the Far Eastern, Siberian, and Ural regional departments, should be transferred to their ownership.

It is also necessary to seek new principles of property management. It would be absolutely incorrect and unjust to centralize and reserve everything for the presidium of the USSR Academy of Sciences and its subdivision. The solution here lies in the delegation of the necessary rights to the scientific community. Neither the presidium nor the broadest meeting is capable of settling all the economic and technical questions of property management. In conformity with this three basic forms of relations between the subject and the property within the Academy should be examined.

Academywide objects, which, incidentally, can be placed under the day-to-day management of the scientific research institutions, were spoken about above.

The assets and other property, which are in the exclusive use of the scientific research institution, as well as were obtained by means of special-purpose budget financing, are being placed under the full economic jurisdiction of the institution. Here the institute owns, uses, and disposes of the indicated property and at its own discretion carries out with respect to it any actions that are not at variance with the law. The regulations on ownership are applied to the right of full economic jurisdiction, if not

otherwise stipulated by the law, the charter of the USSR Academy of Sciences, or the charter of the regional department.

The property, which was acquired by the institute as a result of its scientific and economic activity, is the direct collective property of scientific research institutions. Here it is important not to allow pilfering and commercialization of the means and assets, which are collective property and are necessary for the assurance of the normal and productive functioning of the Academy of Sciences.

Moreover, I will note that the individual charter of the institute, institution, or organization will regulate the distribution of competence and powers among the director, the scientific council, labor collectives, and other organs of the legal entity and in the area of property management.

Thus, in questions of the specification and implementation of the basic principles of the owning of property the USSR Academy of Sciences should be guided by the expedience and feasibility of the decisions on the preservation and consolidation of the material potential of the Academy.

In conclusion I will say: The question of the property of the Academy of Sciences was as if settled in detail, our main task is not to allow losses of the accumulated most abundant potential. Not destruction, but creation is our goal!

Organizational Changes, Issues in USSR Academy of Sciences

Geological Information Center

917A0118A Moscow POISK in Russian No 10 (96).
1-7 Mar 91 p 2

[Article by Yelena Valentinova: "...It Decided to Organize the Scientific Geological Information Center of the USSR Academy of Sciences"]

[Text] As Vice President of the USSR Academy of Sciences N. Laverov noted, in the system of the Academy of Sciences there are many institutes for the study of deep space, but today one of the basic tasks is the study of earth from space. The new scientific center is also being established for these purposes. At it work on the study of natural resources will be performed, geological maps with petroleum and gas deposits will be compiled, and the crop yield will be forecast.

All research will be conducted within the framework of the State Scientific and Technical Program "Global Changes of the Environment and the Climate."

USSR Pilot-Cosmonaut V. Lebedev was appointed organizing director of the center.

UrAn Introducing Firm

917A0118B Moscow POISK in Russian No 10 (96).
1-7 Mar 91 p 4

[Article by POISK correspondent Lidiya Usacheva (Sverdlovsk): "UrAn From the Urals"—first paragraph is POISK introduction]

[Text] A new introducing firm—UrAn—has been established under the Ural Department of the USSR Academy of Sciences.

This new scientific production association owes its origination to the elimination of the recognized, but, as life showed, ineffective Administration of Planning, Organization of Applied Research, and Introduction in the apparatus of the department.

"Our main task is the implementation of the proposals of scientists," says UrAn Director Candidate of Technical Sciences Valeriy Gorbachev, he is the secretary of the party committee of scientific institutions of Sverdlovsk. "While for this a data bank on developments of the Ural Department and the degree of their completion is being established. The establishment of joint ventures and the organization of our own works for the output of science-intensive products are in the plans. We intend to revive exhibition activity and patent and license work."

Henceforth the new association will also be in charge of all questions concerning buying and selling, including foreign trade transactions.

Far East Publishing in Peril

917A0118C Moscow POISK in Russian No 10 (96).
1-7 Mar 91 p 4

[Article by POISK correspondent Vladimir Oshchenko (Vladivostok): "The Apartments Are Yours, the People Are Ours"—first paragraph is POISK introduction]

[Text] It appears that at the center of the Far Eastern Department of the USSR Academy of Sciences—Vladivostok—it will soon be simply impossible to publish a scientific article.

The board of directors of the Primorskiy Printing Combine has its own idea of science and the basic scientific product and is confidently dictating its own terms to scientists. Last year the editorial board of VESTNIK DALNEVOSTOCHNOGO OTDELENIYA AKADEMII NAUK SSSR was denied acceptance of manuscripts with mathematical formulas and Roman type. Write, they say, in Russian.... While the journal BIOLOGIYA MORYA, which has considerable prestige throughout the world, has the prospect of ceasing its existence altogether. The board of directors of the printing combine is demanding that the publishers of BIOLOGIYA MORYA find apartments for the printers. While currency claims have been lodged against the newspaper DALNEVOSTOCHNYY UCHENYY. The publishing house of the kray committee of the Russian

Soviet Federated Socialist Republic (RSFSR) Communist Party agreed to print this weekly in a run of 10,000 copies only upon payment of half of the cost of the publication of the newspaper in dollars, which editorial board never had.

Botany Institute Personnel Not Paid

917A0118D Moscow *POISK in Russian* No 10 (96),
1-7 Mar 91 p 2

[Article by POISK correspondent Arkadiy Sosnov (Leningrad): "They Are No Longer Paying Botanists"—first paragraph is POISK introduction]

[Text] In February the associates of the Botany Institute of the USSR Academy of Sciences did not receive their

wage. "There is no money in our bank account," representatives of the administration told the scientists.

"Worse than that, we got into the card file," Vladimir Razumov, deputy director of the Botany Institute, elaborated. This means that after the payment of bills the institute will still be in debt. The rates for gas, water, and electric power have increased. If you do not pay, they will disconnect them, the most valuable plants in the hothouse will die. While its associates—all right, it is possible to explain to them, they will understand....

Now at the Botany Institute there is a "policy of economy"—no one is going on business trips, no one is talking "long distance"—they are sitting quietly and waiting for money.

Educational Reforms Essential for Soviet Science

91740113A Minsk SOVETSKAYA BELORUSSIYA
in Russian 23 Mar 91 p 2

[Article by Doctor of Philosophical Sciences Prof. A. Karlyuk under the rubric "Thoughts on a Problem": "People With Superficial Knowledge Around Science"]

[Text] The intellectual potential of society determines today the level of its economic development and defensive capability, affects the progress of culture, and leaves a mark on the understanding of the world. That is why it is painfully regrettable to note the obvious lag of Soviet science behind the achievements of scientists in developed countries. But there is no escaping the facts. During the postwar years American scientists have received or have shared with foreign colleagues 119 Nobel Prizes, while Soviet scientists have received or have shared only 16. Our revenues from the sale of licenses on the world market are one-fortieth as much as American revenues. In 1990 only three Lenin Prizes were awarded in science and technology—the smallest number in one conferment in their entire 65-year history. The fact is a symptomatic one, which is in line with the overall state of our science, first of all basic science.

There are many reasons for that. Immediately after October a thoughtless attitude, to put it mildly, was displayed toward intellectuals. Scientists of the highest rank were exiled from the country or fled themselves. In exile they made an appreciable contribution to foreign science, which, incidentally, is also recognized in the West. Subsequent years were marked by the devastation by Stalinists of the Soviet school of genetics headed by Academician N.I. Vavilov, by the "outlawing" of cybernetics as a "bourgeois pseudoscience," by a campaign against the theory of relativity of A. Einstein from the standpoint of "Kratkiy kurs istorii VKP(b)" [A Short Course of the History of the All-Union Communist Party (of Bolsheviks)],.... It is possible to go on and on with this service record of the profligates from science headed by "the father of peoples."

The ill-considered investment policy made itself felt both in the molding of personnel of high scientific skill and in the creation of the conditions for their work. Now a professor of a higher educational institution earns 500-550 rubles [R], while the wage of a trolleybus driver in Moscow is equal to R1,000-1,500. On the average the wage of our scientists comes to 80 percent of the wage of workers in industry. An obviously abnormal situation—more skilled labor should be higher paid than less skilled labor. That is how it is done in the countries of the West, where the gap between the remuneration of labor in science and industry in favor of science is very significant. I will name another impressive figure: In the United States the supply of a scientific associate with instruments and information is a hundredfold greater than in our country.

The cited data to a certain extent explain the dynamics of the number of scientists. In 1990 in the USSR there

were a little more than 1.5 million scientists and science teachers, in the United States there were 2.73 million. The share of our scientific personnel in the world during the period from 1975 to 1988 decreased from 24 to 19 percent, while in the United States, on the contrary, it increased from 23 to 34 percent. It is also rather interesting to note that in the middle of the 1950's our country according to the intellectual rating was in the top three, now it is in the fifth group of 10 countries.

Such a rapid slide to no small degree is connected with the state of public education. I will venture to dwell on just one circumstance. When the first artificial earth satellite was launched, the Americans began to search feverishly for "the launch pad of the Russians." And they found it—it was the public education system of the late 1950's.

Then destructive innovations took place. It began with the introduction of a universal mandatory secondary education, for which society was not prepared spiritually and psychologically. The educator, who had been placed in a desperate position, raised ill-fated "C students," and schools began to produce for the most part half-educated ignoramuses.

The situation was aggravated by the fact that the transition to a universal secondary education was also not supported by a material base. For decades two-fifths to one-half as much has been spent on public education as in developed countries.

As a result the level of training of higher educational institution (VUZ) reinforcements, who already in school were accustomed to report ostentation, decreased appreciably. Already during the first months of instruction at a higher educational institution a large portion of the students begin to seek ins and outs in order to get the necessary grades and passing marks on tests with the minimum expenditures of labor, and "to go have fun" even better—a patron (how many of them there are at higher educational institutions!) "will put in a word" for someone, another one will make use of a crib sheet, a third one gets the better of the examiner by wearing him down....

And once again there is the poverty of VUZ equipment. Here are the following data: The actual annual spending on the training of one undergraduate at higher educational institutions of the United States is 6.4-fold more, in Great Britain it is 4.8-fold more, and in Japan it is 4.7-fold more than in the USSR. The lack of specially equipped buildings and the worthless equipment of educational laboratories and studies are being felt especially keenly at technical higher educational institutions.

It is difficult or even impossible for a young person, who obviously failed to obtain sufficient knowledge at the secondary and higher school, to rise to the level of a scientific understanding of the world. Nearly 40 years of experience of work with graduate students convinces me of this. Without proper training they never grasp the relatively simple truths of philosophy, displaying an

extremely limited outlook and incompetence, which at times reaches the point of being amusing, even in their special, technical disciplines.

In asserting this, I am not claiming anything new. Much has been said about the need to restructure education. But the main question is one, so to speak, of personnel: How one is to see to it that pupils and teachers, undergraduates and professors, and the administration of educational institutions would equally be objectively interested: some in obtaining thorough knowledge, others in the training of highly skilled personnel. For the present no one bears any responsibility for the low level of the educational process.

And some opinions and actions of Chairman of the USSR State Committee for Public Education G.A. Yagodin are really convincing. The impression is being created that he far from understands how and on what higher educational institutions live today. It is both possible and necessary to permit a well-trained undergraduate, who in addition knows how to make use of educational and scientific literature, to attend lectures freely. But, unfortunately, there are few such undergraduates. The remainder perceived the free attendance of classes as an opportunity for loafing. Some even began to contemplate which subjects they need and which ones should simply be eliminated from syllabuses, it is, of course, "democracy."

In short, the "perestroyka" ideas of G.A. Yagodin did a disservice to the higher (only the higher?) school. Today it needs most of all the tightening up of executive discipline in all its units—from ancillary services to the rector's office—and the increase of the self-discipline of all the participants in the educational process—from the undergraduate to the professor.

Sociological studies show with all certainty: The professional and cultural level of school and VUZ educators is very low. Educational institutions have not become centers of spiritual attraction. And for the present no changes in this direction are emerging. On the contrary, the overall level of the development and special training of the people entering graduate studies is decreasing year after year. At the Belorussian Polytechnical Institute a supplementary enrollment has to be announced in order somehow to fill the vacancies. As a result many graduate students can write only something semiscientific. But years pass, a portion of them become candidates of sciences and begin in turn to produce similar people with superficial knowledge or to engage in something parascientific. The consequences of such semiscience and semi-education are frightening!

Now, it seems, it is very important to specify the list of subjects being studied in each specialty. An engineer cannot know all of them, and there is no need for this. The careful selection of the actually necessary subjects will make it possible to present them in a more extensive scope. Here, I believe, it is necessary to provide for the extensive training of an engineer in mathematics and in

the basic science that is close to his specialty. An engineer without a thorough knowledge of his specialty and a broad outlook at best is a good draftsman. One aspect of the improvement of VUZ education seems like that to me.

The question of teaching social science subjects at the secondary and higher school is urgent. The economic and political crisis of society and the blurriness of the image of its future, that is, the lack of clear ideological concepts, are present. Numerous antisocialist formations are taking advantage of this circumstance in the struggle for power.

Beauty will save the world, Dostoyevskiy believed. Today we need culture in its broadest understanding: This is the great intellectual development of a person, his realization of his duty to society, "the beauty of moral feeling" (Chernyshevskiy), tact in relations, and a tendency for everything perfect—from art to the ability to speak. How rarely cultured people are encountered.... You listen for a while to a broadcast from a meeting of the session of the Belorussian SSR Supreme Soviet and you get out of sorts—the noise, the shouts, the deputies interrupt each other, the speaking style is clumsy. And these are the chosen representatives of the people! People must be educated properly. But who must educate them? At the Belorussian Polytechnical Institute, for example, the teaching of social science subjects (and they are particularly important in the formation of the personality of the undergraduate) is under the jurisdiction of the offices of the deans. But at times they do not want to hear about anything, as if there is nothing more important in the world than bolts and nuts.... We need not simply good specialists, but also specialists who are devoted to their own people. The departure from the USSR in 1989 alone of more than 70,000 scientific personnel, for example, cannot leave the Soviet individual indifferent.

What is it necessary to do for a radical change in the public education system? How is one to increase the effectiveness of scientific research and, hence, to speed up the progress of technology? It is impossible to achieve the desired results just by increasing the investments, new organizational forms are also required.

It is gratifying that now the sweeping abuse of the prerevolutionary school as a school of "regimentation and cramming" no longer exists. Gymnasiums, modern secondary schools, lyceums, and other educational institutions of this type provided an enviable education. Therefore, one can only welcome the establishment of such institutions in our country. In Belorussia the first gymnasiums and lyceums have been opened, but half of the schools have become specialized ones. Money is required for this. A class of 40 people at a lyceum is an absurdity, just as it is absurd to study the computer from a diagram drawn in chalk on a blackboard. But, it seems, the most difficult thing is the establishment of a teachers' corps for institutions of the new type. It is possible to

send hardly any of the present educators of the secondary (and higher) school to gymnasiums and lyceums. But without teachers with the proper training their opening will reduce merely to a change of the sign. And the main thing is that it is impossible to make anyone go to gymnasiums, lyceums, and other educational institutions. Otherwise we will again come to the profanation of the very idea of education, as was the case with the introduction of a universal secondary education.

The higher school also needs radical reorganization. It is needed not last of all for the drastic intensification of scientific research. It is impossible to tolerate the existing situation. Now 35 percent of the scientific personnel and nearly half of all doctors and candidates of sciences work at the higher school. Only 2.02 percent of the budget allocations are being earmarked for higher educational institutions for scientific research. If you consider that professors and instructors are kept very busy with educational work, it will be clear why the contribution of the higher school to science, particularly basic science, is relatively small. Science is "made" mainly at the USSR Academy of Sciences and the republic academies.

In nearly all other countries the picture is different—scientific development (basic and applied) is conducted mainly at higher educational institutions. Most often of all the professor and a group of five or six capable undergraduates are the unit that moves science. And in prerevolutionary Russia prominent scientists worked

primarily at higher educational institutions (D.I. Mendeleev, N.I. Lobachevskiy, A.G. Stoletov, and others).

It is not a question, of course, of the cutback of scientific development at the academies. It is necessary to reflect a little on drawing science and the process of education closer. I believe that without any detriment to the matter it is possible to reduce by at least one-half the enrollment in higher educational institutions (we have more than enough half-educated people with VUZ diplomas). The assets freed in this case would make it possible to strengthen the material base of higher educational institutions and to improve significantly the daily life of undergraduates. And the main thing is that this step would make it possible to establish the close contact of professors with that portion of the undergraduates, who want to and can engage in scientific research work. Then there would be the truly natural selection for graduate studies.

The weakest spot in the "education—science—technical progress" system is the lack of any attention whatsoever to talented people. Without going into the details, I will note that in the West there are an efficiently developed method and concept of the identification and support of talented people at each stage of their life: child—school child—undergraduate—specialist. We do not have such a concept. It is necessary to worry about the identification and creative growth of talented people, for at any level of the development of science and technology the human factor is decisive.

Defense Secure Document Transmission System To Be Marketed

917A0110A Moscow IZVESTIYA (Union edition)
in Russian 21 Mar 91 p 3

[Article by V. Remizov: "Special Communications for Everyone"—first paragraph is IZVESTIYA introduction]

[Text] On 19 March a commercial automated data transmission and document exchange network was exhibited in the USSR Ministry of Communications. It is called Istok-K and henceforth will serve everyone who wishes. For the corresponding fee, of course.

This confidential information transmission system was put into operation in 1984 for the needs of "defense." Today only 2,500 enterprises and organizations use its services. Conversion has made it possible to make Istok available to all. By the end of this year it will have accepted another 1,000 users. Subsequently their number may increase to 1 million.

Istok encompasses the entire territory of the USSR and is used (as a lessee) by all the types of communications, which the USSR Ministry of Communications has, including satellite communications. In order to become a user of the new communications system, it is sufficient to have if only a telephone. Your possibilities increase accordingly, if your computer or facsimile machine is hooked up to the network.

Such concepts as: electronic mail, dialog, query-response, the transmission of large data files, and the making of communications available to an exclusive user group, are strange to us, who have become accustomed for the most part to cranking the telephone or to the urgings of the "girl" at the switchboard. Nevertheless, all this is an incomplete list of the services of Istok-K.

Not by chance did representatives of banks, brokerage offices, and exchanges attend the presentation. Apparently, their organizations will be the first ones who will hook up their computers to the new network. The advantage, which they will obtain, is too obvious—it will be possible to conclude a deal with a partner without leaving the office. For this it is sufficient to exchange the necessary documents with their partner via the network. The real work for Istok-K, as specialists believe, will begin when an extensive network of databases has appeared in the USSR. Incidentally, this year through a French intermediary Istok-K will be hooked up to a number of international databases.

In conclusion a few technical parameters. Information is transmitted in one and a half minutes to one hour. The sending of information to the wrong address or its loss is practically impossible. In any case, for the inaccurate performance of a service the owner of Istok-K, the Telekom concern, responds not with apologies, but with money. Incidentally, about the prices. As specialists assure, in Istok-K they are considerably less than world prices. Thus, the transmission of a 128-character message within the limits of a city costs 11 kopecks. The cost of the equipment of a workstation, for example, at a rayon branch of a bank is 27,000-31,000 rubles [R]. Its installation is R980. The user fee is R720. This year the Istok-K network, according to the estimates of its owners, should yield revenues of R48 million. The expenditures will come to R12 million.

Experts from banks and business offices, having subjected Yevgeniy Davydov, chief designer of the network, to a detailed "interrogation," came to the conclusion that it is worth dealing with Istok-K. The network is very reliable and, most likely, will operate without failures. The fact that Istok-K was developed for the needs of "defense" serves as some guarantee of this. However, this fact, they believe, may also have drawbacks—the complete "privacy" of our defense sectors enables them to lag behind the world level.

If we give it a try, we will see, they summarized.

Draft Patent Law Stalled; Criticism Renewed

917A0105A Moscow *EKONOMIKA I ZHIZN*
in Russian No 4, Jan 91 p 8

[Article by Doctor of Juridical Sciences Professor V. Dozortsev under the rubric "In the File of the People's Deputy": "Under the Guise of Stipulations. Comrade Deputies! The Fate of Inventors Depends on Your Decision"—first paragraph is *EKONOMIKA I ZHIZN* introduction]

[Text] The new Law on Invention has taken many years to prepare. Several versions were offered. Two were published. The consideration of the last of them at the first reading has been included in the agenda of the USSR Supreme Soviet. Its passage is quite likely, but it is evoking serious objections with regard to all the basic items.

The **main** innovation of the draft lies in the declaration of the invention to be a commodity, which is completely justified. With the transition to market relations the invention, of course, is also turning into an object of the economic, market turnover. But the patent should become the dominant form of the protection of an invention. Thus, the patent is turning from an auxiliary document, which for the present is of practical importance only for foreigners, into the only document that protects the rights of the inventor.

But the notion that this step alone will adapt the protection of inventions to the system of commodity-money relations is very primitive. The patent system should be linked with the entire economic and social sphere.

The rule regarding to whom the patent will belong is of vital importance. In other words, who is the owner of the invention? Both the creative activity of innovators and the proper use of inventions depend on this.

An invention is the result of the creative labor of its author. He should also remain the owner of his creation, if only initially. The author should have the opportunity to manage the fate of the development as he wishes, in particular, to sell it. It may seem that the draft is based precisely on this principle. But upon careful reading disguised, hardly noticeable stipulations, which in practice reduce everything to "naught," come to light.

The draft stipulates that the right to what are called "job-related inventions" (ones developed during the fulfillment of an official assignment) belongs to the organization, at which the author works. According to present statistics their share approaches 95 percent of the total number. Hence, practically all the inventions developed by inventors will be expropriated from them.

True, in the draft of the Law there is a "fig leaf." It is stipulated that the right passes to the enterprise only if it has concluded the appropriate contract with the author. But it is quite obvious that it is practically always easy for the administration, on which the worker is dependent, to force him to sign such a contract.

The concept **itself** of a job-related invention is justified by the fact that it was made during working time, on plant equipment, or with the use of factory materials and so on and so forth. Moreover, somehow it was forgotten that millions of people receive official assignments daily, while a handful of people invent. Is it real just to deprive an author of the right to his own ideas? While the right of the organization to use an invention free of charge in its own production can serve as compensation for favorable conditions for creativity. The author should himself also conclude a contract with other organizations for the use of his development. In other words, it would be proper to turn upside down the entire structure of the draft.

The state, I am afraid, will also appropriate almost completely the remaining 5 percent of job-related inventions. The establishment of a special organization—the USSR State Fund of Inventions—is envisaged for this. According to the draft the payment of very high fees, which in practice are beyond the means of many authors, is also envisaged for a patent.

In case of the transfer of an invention to the fund the author is exempt from the fees and may even receive a reward. This is an excellent means of confiscating an invention from an author—only by means of not an administrative, but an economic mechanism.

Now about what are recognized as inventions. The definition of an invention should be as precise a one as possible, which excludes the arbitrariness of the expert commission. The draft establishes: "An invention is new, if it is unknown from the level of technology." It turns out that the solution, which has been claimed by the author, is compared not with another solution, but with an amorphous "level" of technology, which signifies no one knows what and is determined no one knows how. Such a comparison of dissimilar categories is absolutely illegitimate. It is possible to compare a solution only with another solution.

It is simply impossible to regard the inaccuracy, which was allowed by the project, as an innocent one. It is very convenient for the expert commission and places the author in an extremely uncertain position.

The **drawbacks** of the new definition are especially evident in comparison with the prevailing legislation, which defines very precisely the criteria of the novelty of inventions. Why replace the exhaustively precise wording with vague wording? The point is that in the draft it acquired such a form which meets the departmental interests of the administrative organs that supervise inventors.

In the area of invention only one administrative structure is needed—the one that deals directly with the examination of inventions. Such an organization exists—the All-Union Scientific Research Institute of State Patent Examination (VNIIGPE). In no country of the world are there structures that stand above the expert commission.

We have a superstructural organ—the State Committee for Inventions and Discoveries attached to the USSR State Committee for Science and Technology. Its rank was reduced comparatively recently—previously it was directly under the jurisdiction of the government. The draft envisages the return of the former status to it, which in itself will give rise to new powers and an increase of spending. Moreover, the establishment of two new administrative structures—the USSR State Fund of Inventions and the USSR Patent Court—is envisaged.

The USSR State Fund of Inventions was initially contemplated as a center of production activity for development work with inventions. Then the idea was rejected as unrealistic. Now it has remained as a single (and the only) commercial center for the sale of inventions that belong to the state. As a monopolist it will not be interested in showing real concern for every invention. Especially as its receipts do not serve the goals of the basic activity on the acquisition of inventions. The functions of the fund in general are not specified thoroughly in the draft. Is it worth establishing the organ, if there is not a clear idea of how it should operate?

The increase of the rank of existing administrative superstructural structures instead of their elimination and the establishment of new administrative structures run counter to all the present trends of the development of the economy.

Finally, it is also necessary to recognize the norms of the reward as extremely poor.

In some respect the author is in accordance with the draft in a more advantageous position than in accordance with prevailing legislation. The amount of his reward for job-related inventions and inventions, which have been turned over to the USSR State Fund of Inventions, will come to not less than 15 percent of the profit that falls to this invention. (Now it is 2 percent of the economic impact, the method of the calculation of which is very questionable.) And the reward should be paid not for five years from the moment of introduction, as has occurred up to now, but for 20 years (from the moment of the submission of the application). Moreover, the real amount of the reward is specified by an agreement of the author with the enterprise or firm, which uses the invention. If the inventor exploits his own invention, he will receive as much as he is able to earn, without any limitations.

The author, it would seem, will gain very perceptibly. But....

First, now the reward is paid regardless of the term of effect of protection, that is, even in case of the introduction of the development 15 years after the date of priority, when the effect of protection in accordance with current legislation ends. While according to the draft after the expiration of a patent it will not be paid. But we know that in practice the realization of inventions is dragged out nearly always and by no means through the fault of the author.

Second, the amount of the reward is calculated on the basis of "the share of the impact," which is obtained "on account of" this invention, or the "share" of the production cost, for which this invention "accounts." Everyone, who has been faced in the slightest degree with the need to determine in practice the mentioned "shares of the impact or the production cost," knows that it is possible to do this very, very approximately. Thus, the minimum established by the draft turns into an illusion.

Third, the enterprise is permitted to sell a license for a job-related invention, without requesting permission from the author to do this. The inventor in this case should receive a reward from the new owner. The director or the chief engineer, let us assume, but nowise the developer himself, will come to an agreement on the specific amount. The enterprise can also sell the patent for an invention. The draft does not specify whether the author will come to an agreement on the amount of the reward with the new owner. Subsequently a part of the profit, which is derived in case of the introduction of a development, should also be transferred to the author. This is left entirely to the conscience of the new owner of the patent. Neither his responsibility nor his obligation is stipulated in the contract. In the end the author in general might not find out that his invention has been introduced. The procedure, in case of which the use of an invention is accomplished without the consent of the author, while a contract is concluded on the reward for an already used invention, is very dangerous.

Let us summarize what has been said. The draft as a whole correctly recognizes the invention as a commodity, nevertheless **it does not protect the interests of inventors.**

Comrade members of the USSR Supreme Soviet! Display the maximum attention when discussing the draft. In my opinion, it is dangerous for inventors. Do not pass it even at the first reading!

Increased Contacts With Russian Emigre Scientists in Israel Foreseen

917A0106A Moscow MOSKOVSKAYA PRAVDA
in Russian 12 Jan 91 p 3

[Article by S. Kukhianidze under the rubric "Contacts".
"I Am Not Answerable for All of Odessa"]

[Text] Just recently Soviet scientists, when encountering at various international symposiums and conferences their colleagues from Israel, merely shook hands with each other diplomatically. At best in this case they also smiled, but no more. Relations were formed according to the principle "hello-goodbye"—Academician Igor Mikhaylovich Makarov, chief scientific secretary of the presidium of the USSR Academy of Sciences, prefaced his account of the trip to Israel with such a preamble.

And there you are—"the first breach has been made" in the wall that at one time was made tight with concrete: An agreement on scientific cooperation between the two countries has been signed. It was signed in Jerusalem on our side by President of the USSR Academy of Sciences G. Marchuk and on the Israeli side by Minister of Science and Technology Y. Neeman.

In the words of I. Makarov, who participated in the preparation of this document, the agreement provides for the exchange of scientific information between the two states, as well as cooperation in research activity. The areas of cooperation are quite broad. These are, in particular, mathematics, physics, cybernetics, nuclear physics, and even sociology.

Speaking at the agreement signing ceremony, the president of the USSR Academy of Sciences noted that Soviet scientists, who had emigrated at different times to Israel, would make the first important contribution to the development of scientific cooperation between the two countries. By the way, the scientific potential of this country to no small degree relies on them. To the question, what is the percentage of scientists who are emigrants from the Soviet Union at present in the country, the person I was talking with replied: "I cannot give the percentage exactly, but there are quite a large

number of them." At nearly all universities and research centers, in his words, there are "our people." Moreover, many of them hold there high management positions and are engaged in leading development.

"How do they live?" I asked I. Makarov. "Like people," he briefly replied.

The statement made recently by the minister of science and technology there also testifies quite well to how highly they value our "brains" in Israel. He said that he would resign, if the ministry of finance of the country did not allocate 29 million shekels (on the order of \$14 million) for the reception and job placement of the 6,000 Soviet scientist who should arrive in Israel. The argument of the minister is curious: If we are not able to provide them with work, other countries, particularly the United States and the Republic of South Africa, which are also interested in Soviet scientists, will give them such an opportunity.

"From where is this figure of 6,000?" I was interested in finding out from Igor Mikhaylovich. He replied that he did not have any idea. "I am not answerable for all of Odessa," I. Makarov added jokingly. "I can only say that no one is going anywhere from the Academy of Sciences."

"The 'brain drain' worries us very much," the academician nevertheless admitted. In his opinion, in order to halt it, it is necessary to do two things. First, to properly supply scientific research institutes and other scientific centers with materials and equipment, so that scientists would not experience the everyday difficulties in work, which are customary in our country, when one literally has to fight for every instrument. Second, to show concern for their conditions of daily life, which, to put it mildly, lag greatly behind foreign countries. After all, whether you like it or not, I. Makarov concluded, scientists are the property of the nation.

While sharing briefly the impressions from two trips to Israel, the person I was speaking with related that the meetings at all levels were distinguished by mutual interest and sincerity. Incidentally, very often, he added, it was possible to communicate without the services of an interpreter.

Democratization Committee Formed for Ukrainian Academy of Sciences

917A0130A Kiev KOMSOMOLSKOYE ZNAMYA
in Russian 10 Apr 91 p 2

[Interview with Doctor of Technical Sciences Vasily Aleksandrovich Kuzmenko, head of a department of the Institute of Problems of Material Science of the Ukrainian SSR Academy of Sciences; date and place not given: "Is It Alive, the Academy?"—first paragraph is KOMSOMOLSKOYE ZNAMYA introduction]

[Text] Today you will no longer surprise anyone by organizing a new committee. However, this time not some "extremists," but respected people—doctors of sciences, professors, and other "comrade scientists, docents with candidate degrees..."—established it. Doctor of Technical Sciences Vasily Aleksandrovich Kuzmenko, head of a department of the Institute of Problems of Material Science of the Ukrainian SSR Academy of Sciences, told us about the goals of the establishment of the Committee for the Democratization of the Ukrainian SSR Academy of Sciences.

[Kuzmenko] Strictly speaking, the basic goal of our committee is incorporated in its very name. The activity of the academy, in our opinion, needs considerable democratization.

We set forth our position in a declaration addressed to the general meeting of the Ukrainian SSR Academy of Sciences, which is being held in Kiev on 11 April.

In it, in particular, it is stated: "In addition to 350 academicians and corresponding members, tens of thousands of citizens: doctors and candidates of sciences, engineers and technicians, laboratory workers and administrators, and other working people, work at the Ukrainian SSR Academy of Sciences. And the term indicated in the decision of the Presidium of the Supreme Soviet of the Ukraine, as well as in the draft of the Charter of the Ukrainian SSR Academy of Sciences—**self-management**—inspires all of us.

"In expressing doubt about the competence of the General Meeting of the Ukrainian SSR Academy of Sciences to be the supreme manager of affairs at the self-managed Academy of Sciences of the Ukraine, we cannot but note the passivity of this meeting and its shirking of the settlement of vitally important questions of our academic community, for example, the public examination of the budget of the academy, material and housing problems, the organization of new scientific institutions, and others. All the important questions have been turned over to the discretion of the Presidium of the Ukrainian SSR Academy of Sciences and are being settled by a limited group of people. As a result there are distortions in the development of the scientific directions that the republic needs; an acute housing crisis; the hegemonization of members of the apparatus and administrators against the background of the lack of protection of the personnel of science, who are not registered as 'members

of the Ukrainian SSR Academy of Sciences'; supplementary payments to the latter not in accordance with their labor, but for cliquishness; the invariable dictation of the Presidium of the Ukrainian SSR Academy of Sciences and its subdivisions, in spite of 'perestroika,' over scientific institutions, particularly in the fact that unsatisfactory candidates for executives of institutes and structural subdivisions are not approved contrary to the will of scientific collectives.

"We believe that for the solution of academywide problems, present and future, it is necessary—in full accordance with the decision of the Presidium of the Ukrainian SSR Supreme Soviet on self-management—to establish a democratically elected constituent assembly of the Academy of Sciences of the Ukraine, having formed in so that it would be the representative of all strata of workers of the academy, which has many thousands of personnel..."

Of course, people may reply to us that the academy is a specific institution, and one prominent scientist in science is worth many, many "draft horses." Well, such an idea, in principle, is correct. But the whole point is that a significant portion of the present academicians and corresponding members became such during the years of stagnation by no means for outstanding scientific achievements. Our anxiety over the further development of Ukrainian science is also due precisely to this circumstance.

Only the resolute democratization of the work of the academy will be able to promote the progress of scientific thought in the Ukraine.

Editorial note: The establishment of the committee and the signatures affixed to the declaration of scientists with high scientific degrees and prize winners, in our opinion, once again testify that the affairs of our science are not entirely good. Not by chance, after all, is it difficult to recall in it any world-level discoveries that were made in recent years. In some aspects and opinions the position of the committee is probably not indisputable. However, it obviously deserves attention and extensive discussion.

Special Committee To Develop Estonian Science Policy

917A0119A Tallinn SOVETSKAYA ESTONIYA
in Russian 20 Mar 91 p 1

[Article by Villi Ehatamm (ETA): "In the Scientific Council of Estonia"]

[Text] The Scientific Council attached to the government of the Estonian Republic was established for the formulation of the science and technology policy of the Estonian Republic. The council operates under the supervision of President of the Academy of Sciences of Estonia Arno Keerna and the Academy of Sciences, the Science Fund of Estonia, the Estonian Innovation Fund, the Council for Information Science of Estonia, and representatives of the higher school belong to it. The

tasks of the Scientific Council are to formulate the state science and technology policy of Estonia and to elaborate the recommendations needed by the government.

On 19 March the regular meeting of the Scientific Council under the chairmanship of Academician A. Keerna was held. Academician Peeter Saari gave a report on the basic question: on setting up an international examination and evaluation of the scientific research of Estonia. It is planned to set up the international examination, the results of which will subsequently become one of the bases of the allocation of financing and the support of scientific research, with the assistance of foreign experts, first of all scientists of the Nordic countries. On 26-27 March a delegation of the Swedish Royal Academy of Sciences headed by the president of the Academy and the scientific secretary will come to the Academy of Sciences of Estonia in order to come to an agreement on the basic principles of the activity of Swedish experts. The Scientific Council regards as necessary the setting up of the examination of scientific research simultaneously at all scientific institutions and higher educational institutions, where the given research theme is represented.

The Scientific Council also discussed the introduction of a unified system of the registration of the scientific research being conducted in Estonia, which would enable scientists if necessary to obtain rapid scientific information. It was decided to organize the corresponding information center under the presidium of the Academy of Sciences of Estonia.

Organizational Progress in RSFSR Academy of Sciences

Yeltsin Decree Published

917A0111A Moscow POISK in Russian No 10 (96).
1-7 Mar 91 p 1

[Decree No. 636-1 of the RSFSR Supreme Soviet of 15 February 1991 "On the Subsequent Work on the Organization of the Russian Academy of Sciences"]

[Text] Having heard and discussed the report of the Committee of the Russian Soviet Federated Socialist Republic (RSFSR) Supreme Soviet for Science and Public Education, "On the Basic Principles of the Organization of the Activity of the Russian Academy of Sciences," the RSFSR Supreme Soviet resolves:

1. To take into consideration "The Basic Principles of the Activity of the Russian Academy of Sciences," which were formulated by the Committee of the RSFSR Supreme Soviet for Science and Public Education.
2. The Presidium of the RSFSR Supreme Soviet is to consider and approve the composition of the Organizing Committee for the Drawing Up of a Draft of the Charter of the Russian Academy of Sciences, which was formed by the Committee of the RSFSR Supreme Soviet for Science and Public Education with the participation of

the USSR Academy of Sciences, scientists and specialists among the RSFSR and USSR people's deputies, and the scientific community, and to commission it to perform all the preliminary work on the organization of the Russian Academy of Sciences.

[Signed] Chairman of the RSFSR Supreme Soviet B.N. Yeltsin

Moscow, the RSFSR House of Soviets.

15 February 1991.

No. 363-1.

Voronezh Branch Planned for Chernozem Zone

917A0111B Moscow SOVETSKAYA ROSSIYA
(1st edition) in Russian 12 Mar 91 p 2

[TASS report (Tambov): "An Affiliate of the Academy of Sciences of Russia"]

[Text] The department of the Voronezh Affiliate of the RSFSR Academy of Sciences, which has been established here, will become the coordinating center of the scientific forces of the Chernozem region, where academic, sectorial, and educational institutes are working successfully. The new subdivision, which received the status of a legal entity and its own account at the bank, is called upon to blend their scientific potential in the structure of the Central Chernozem Region of Russia for the elaboration of a unified science and technology, ecological, and social policy of the area. S. Mishchenko, rector of the local Institute of Chemical Machine Building, became head of the department.

Report on Russian Academy of Natural Sciences

917A0111C Moscow PRAVDA (2d edition) in Russian
27 Mar 91 p 8

[Article by A. Pokrovskiy: "The Authors of Discoveries Have United"—first paragraph is PRAVDA introduction]

[Text] The Constituent Congress of the Scientific Community of Russia at the end of August of last year was not noticed very much among the hectic events of our days. Meanwhile it was worth looking more closely at it—leading authors of registered basic discoveries and founders of new scientific directions were the initiators of the establishment of the Russian Academy of Natural Sciences.

In the heat of the political disputes we, it seems, partially forgot that the welfare of society depends not so much on rally clashes as on the rate of advance along the paths of scientific and technical progress. After all, before dividing something, it is necessary first to make a good-quality, diverse, and as inexpensive as possible a product. But precisely the level of basic research and the development of education and culture also give the

necessary acceleration here. We admit: Neither corresponds to the spiritual potential of our largest republic—Russia.

How is this potential to be activated? the representatives of various fields of the natural sciences, each of whom was to one degree or another a discoverer in his field of knowledge, pondered at their congress. Thus began the establishment of a scientific institution that is still strange for us—an academy which according to its financial and economic status is a public nonprofit organization and operates on the basis of the principles of self-management. Its members not only do not receive academic remuneration, but themselves pay dues, which also serve as one of the sources of the financing of the activity of the academy. The other sources are scientific research, scientific production, scientific educational, and publishing activity, contracts with departments and organizations, and only to a limited extent the RSFSR budget.

At that time, last year, the first 125 members of the RAYeN [Russian Academy of Natural Sciences] were elected. Among them are 30 members of the USSR Academy of Sciences, eight members of the Academy of Medical Sciences and the Academy of Pedagogical Sciences, 40 winners of the Nobel, Lenin, and USSR State Prizes and prizes of the USSR Council of Ministers, and 80 authors of basic scientific discoveries that have been entered in the State Register. Prof. D. Mineyev became President of the RAYeN, Prof. N. Vorontsov became vice president. While the first general meeting of the new academy was held yesterday in Moscow.

In all six sections—physics, chemistry, the earth sciences, biology and medicine, mathematics, information science, and cybernetics, and "The Russian Encyclopedia"—have been established in the academy. It is worth speaking separately about the last one. It is already stipulated in the name of the academy that the sphere of its activity is the natural sciences, but, of course, the scientists could not remain aloof of educational activity. In its plans there are such publications as "Rossiyskiy entsiklopedicheskiy slovar" [The Russian Encyclopedic Dictionary], "Entsiklopediya narodov Rossii" [An Encyclopedia of the Peoples of Russia], the Children's Encyclopedia "Rossiya" [Russia], and others.

The members of the new academy specified as their main goals the analysis of the state, the formulation of a strategy of the development, the promotion of the financing, organization, and coordination of the basic and applied scientific research being conducted in Russia and the introduction of its results, the examination of the most important scientific research programs and scientific discoveries, the overcoming of the gap between basic science and the higher school, and the implementation of such programs as "The Ecology of Russia" and "The Raw Material Base of Russia."

Moldovan Sovereignty Creates Problems for Republic Science

917A0104A Kishinev SOVETSKAYA MOLDOVA
in Russian 19 Feb 91 p 3

[Article by N. Dubina: "The Academy of Sciences: The Path to Independence"]

[Text] The Academy of Sciences has adopted the policy of its own "sovereignty."

To know where to go means to know for what this is to be done. The scientific world prepared in good time for the step to independence: In the middle of last year the Presidium approved the decision "On the Radical Reorganization of the Scientific Activity of the Moldovan SSR Academy of Sciences" and established commissions which elaborated the concept of changes to come. One does not have to convince anyone that changes are necessary—there are no fewer problems in the academic world than in our sinful world.

Good intentions also make an impression. The restructuring of the organization and management of science is planned through decentralization, the assurance of the real independence of scientific institutions in the selection of priority directions of activity, and the improvement of personnel policy. This means that quite a number of temporary scientific collectives, scientific and technical centers, and technological centers, which will operate on a contractual, competitive, or alternative basis, should appear. A laboratory, a department, a group of scientists, and an individual scientist will be able to state freely their opinions on fundamental questions and will be able to obtain through competition a desired scientific theme.

It has been decided to coordinate scientific research in a new way—on three levels. Through scientific councils for problems and for fields and through the republic scientific council, to which the people who specify the strategy of scientific research in the republic will belong. It has been decided, finally, to deal with the fate of young scientists, for the Academy is growing old before our eyes. This is good for something: At the Institute of Zoology and Physiology the average age of a candidate of sciences is 50, while that of a doctor of sciences is 63. As a whole for the Academy of Sciences these figures are a little better, but they do not give pleasure. The administrative staff has grown incredibly. Whereas at the union Academy of Sciences the share of scientific associates in the total number of employees is constantly increasing, at the Moldovan Academy of Sciences it is decreasing and in 1989 came to only 24.4 percent. There are several people, who shuffle documents, per scientist. The very establishment of this fact testifies to the desire to change the situation.

However, desire is one thing, while possibilities are a completely different matter. For the Academy of Sciences in its present state they are very limited, that is why it is also difficult to get rid of the feeling of a certain

pretentiousness of the plans of reorganization. Is it possible to begin building from the roof? The question as applied to such a serious subject, however strange, is also not that simple-minded. Whereas the ukase of the USSR President on the status of the USSR Academy of Sciences freed it from state tutelage, thus far there is no corresponding ukase of the President of the republic. Our parliament is concerned more with politics than with the economy and especially science. Does this not testify that they have forgotten about the foundation of the edifice of independence, which is being erected? For it is unclear how scientific research will be financed from now on. One of the starting points of the concept is the improvement of the financing of basic research. The Academy submitted to the parliament as the desired figure 25-30 million rubles [R]. In spite of this they cut a quite thin piece of the pie for science—more than R21 million less than last year. There is one hope here: The basic sciences will be financed from the union budget, while what has been allocated will suffice the regional sciences. But how does this version accord with the idea of the sovereignty of the republic?

There are more than enough obscurities. As a whole for the country the spending on science comes to 6 percent of the national economy, in the republic it comes to one-tenth as much. Inflation is increasing. Today instruments and equipment cost two- to threefold more than last year. Thus far no one has converted the spending in science into new prices, everything is at the level of rough estimates, nothing more. Moreover, a mechanism of the competitive financing of basic research (a system of grants) has not been developed. It remains a mystery why against the background of such instability Doctor of Economic Sciences S. Maksimilian, who engaged in the study of academic problems, proposed his own formula of the training of new scientific personnel—by the 25-30 percent reduction of the assets released for purely scientific research. How much further are they to be reduced?

But with personnel, and not only young personnel, the situation, without exaggeration, is rotten. The R150 wage of a scientist by no means increases the prestige of intellectual labor in the eyes of a significant portion of the population, which without any education makes three- to fourfold more. Scientists are leaving—for cooperatives, for industry—and science is being bled. And this will continue until their labor begins to be paid for in conformity with the benefit to society.

Another question from the category of, it appears, perpetual ones is how to integrate higher education with science. At the recent general meeting of the Moldovan SSR Academy of Sciences it was discussed quite at length, on the basis of the latest facts, but the discussion itself was the old one. Higher educational institutions do not know the needs of the Academy of Sciences for young scientific successors. The Academy has not found its place in the training of specialists, from year to year there are fewer and fewer undergraduates who have the aptitude for scientific research. And the reference to

countries of the West, where national science is concentrated at universities, was heard again.

There is nothing to say here.... Perhaps, it is also not essential to copy the western model because historically the best professors gathered in our country precisely within academic walls, but it is a fact, and an indisputable one, that large-scale science, which a live umbilical cord does not connect to student audiences, is losing very much. Not for nothing is Academician V. Moskalenko proposing to establish at the government level a system of the certification of higher educational institution (VUZ) instructors.... But for the time being.... For the time being we should do the simplest thing—open the doors of the library of the Academy for undergraduates, who have not lost either the taste for learning or the belief that the main discoveries have not yet been made.

Disputes are going on over an invariably disturbing theme—the procedure of awarding academic titles and degrees. The opinion that local science is perfectly ripe for the independent evaluation of the contribution of candidates has predominated. It is only a matter of the government giving the go-ahead for the firm establishment of a network and the staffs of specialized councils for the awarding of the academic degree of candidate of sciences (and, with respect to a specialty in the field of national culture and language, the academic degree of doctor of sciences). As always, extreme views are clashing. Minister of Health G. Gidirim insists on abandoning degrees altogether as "legacies of Stalin's times." Many scientists fear that the firm establishment of "their own" higher certification commission is capable of leading to the devaluation of academic degrees. Is it possible to keep aloof in science, which is neither Beltsy nor Tiraspol science, but should gravitate only toward world science? And quite specific hitches have not been eliminated here: What, for example, is one to do with candidates in the field of art criticism, when there is not one doctor of art criticism in the republic?

It is a ticklish theme, which, however, one should not avoid. In the decree of the general meetings of the Moldovan SSR Academy of Sciences, which considered the concept of the further development of the Academy, the fact that "the ethnic composition of scientific personnel does not correspond to the ethnic composition of the population of the republic" was mentioned among the shortcomings in the training of scientific personnel. There is no need to argue with the very idea of forming national personnel, including in science. This is a vital necessity, which, moreover, is being actively realized. It is a matter of something else: the danger of an arithmetical approach to the problem. Who will adjust and by what methods the percentage ratios of the nationalities, which live in the republic, and the actually formed ethnic picture at the Academy? What, will dismissals of Russians, Gagauzes, and Jews on the pretext of professional incompetence occur only because there are fewer of them in Moldova? In the same way that personnel were recruited earlier on the basis of party affiliation? About what independence of the Academy is it then in general

possible to speak, if such an important item as the formation of scientific personnel is put into practice on different bases—a national, a political, or then a territorial basis—and not on the only possible basis, the presence of the gift of God, without which one simply cannot do anything in science?

This is a difficult matter under our conditions—to break through to true independence. Especially for the Academy, which needs to avoid the temptation to check the harmony of scientific research, which is aimed at the future, with the algebra of the market and cost accounting, which needs to avoid the possible dictation of newly formed state structures, which absolutely needs to be guided by the light of one beacon—scientific truth.

There are many attacks on the Academy of Sciences. They are blaming it for all offenses, including the fact that not scientists, but writers began in Moldova the revolutionary struggle for national revival. Yes, the Institute of Language and Literature of the Academy of Sciences, which for long years was financed in accordance with the remainder principle, did far from everything that it could for the Moldovan language and culture. Yes, it is necessary to help the Humanities Department. But is the Academy really only one institute, one department? Why then these cries from the side: "The people will not want to finance such an Academy!"? In them are political pressure and complete incompetence in the scientific sphere, the absolute incomprehension of problems which are not solved by a plebiscite. Forget about it, this would be my private, individual opinion. But people, who have achieved much in science, are at a loss, and among them is Academician I. Bersuker, whose name is respected by physicists of the entire world.

Where is the Academy going, to what will it come?

Discussion on Formation of Bashkir Academy of Sciences

Declaration of Bashkir Supreme Soviet Presidium

917A0092A Moscow TRUD in Russian 19 Feb 91 p 1

[Article by A. Valeyev: "In Bashkiriya, Its Own Academy"; first paragraph is source introduction]

[Text] **The Presidium of the Bashkir Supreme Soviet, guided by the Declaration of Sovereignty, has established the Bashkir Academy of Sciences.**

The Bashkir Academy is entrusted with coordinating basic research performed in the leading areas of the social sciences, the natural sciences, and the engineering sciences and with the efficient use of that research in applied areas.

The organizing committee, which consists of 16 of the republic's leading scholars, began its work yesterday. Within a very short period of time it must develop the concept, structure, and charter for the future academy,

all of which will be discussed and confirmed at the first session of the Academy of Sciences of Bashkir SSR, which will take place this spring.

Local Academicians Protest

917A0092B Moscow IZVESTIYA 16 Feb 91
(Union edition) p 2

[Article by Aleksandr Zinovyev, from Ufa: "Academicians Protest"; first paragraph is source introduction]

[Text] **The Presidium of the Bashkir Supreme Soviet has adopted an ukase establishing the Academy of Sciences of Bashkortostan.**

The ukase provides for incorporating in the Bashkir academy that is being created a structure of the Union academy that is already in place here—the Bashkir Science Center of the Ural Department of the USSR Academy of Sciences. That action evoked a sharply negative response among the leadership of the center. Academician G. Tolstikov, the chairman of the center, and six of his colleagues who are corresponding members of the USSR Academy of Sciences spoke out on that topic in a statement that appeared in the newspaper SOVETSKAYA BASHKIRIYA. The paragraph of the ukase in which claims are made of USSR Academy of Sciences property that is protected by the Ukase of the President of the USSR is labelled as politically erroneous. The academicians feel that the establishment of an Academy of Sciences of the Bashkir SSR should be an independent process that does not affect either the interests or the property of the USSR Academy of Sciences. "We are convinced," they write, "that the simultaneous existence in the republic of Union and republic structures is a new form of effective scientific collaboration."

Columnist, RSFSR Official Debate Decision

917A0092C Moscow LITERATURNAYA GAZETA
in Russian No 8, 27 Feb 91 p 5

[Interview of Vladimir Shorin, chairman of the Committee for Science and Public Education of the RSFSR Supreme Soviet, by Oleg Moroz, LITERATURNAYA GAZETA columnist, under the rubric "The World of Man: 'LG' Debates": "Yet Another Ministry? Of Science?"]

[Text] **Moroz:** Frankly speaking, I'm astonished. The Russian Soviet Federated Socialist Republic (RSFSR) Supreme Soviet, on which the gazes of Russians are directed as if it were the last hope in this insoluble period, is engaged in such, forgive me, stupidity—the creation of yet another (as if we don't have enough of them already!) academy of sciences, a Russian academy. I understand: the child has bad heredity, bad genes that came from the previous, stagnant Supreme Soviet (it was that body that adopted the wise decision about the academy). Nevertheless, to saddle the people with yet another, to put it lightly, useless institution...

Shorin: The republic needs a higher expert agency in the field of science, a single agency to coordinate basic research. Besides, the development of the economy of the RSFSR and its regions needs to be predicted.

Moroz: Why can't studies be conducted and forecasts be made without an academy? After all, ultimately it depends on the specialists: either we have them or we don't. The establishment of an academy won't change anything. It's all just bureaucratic logic: if you need to do something—like perform a study or predict something—that means you have to create a new structure. I mean, is that really necessary?

We've got the so-called Hamburg tally: in every oblast, the specialists know quite well who's who—who is higher, who is lower. Ask those who know, and they will name you off the very best experts in any area. No titles or ranks of any kind add anything here. Throughout the world, studies are done by specialists who don't belong to any academy.

Shorin: You're not quite right: much depends on who forms an expert organization and how it is formed. I believe that when it comes to the basic sciences, it is more appropriate to form such an organization with elections from below, instead of appointments from above or enlistment of outside scholars. Of course you could set up a study council without an academy, but the selection of the people for that council would be done in a manner that would still be less advanced than elections to an academy: there would be more randomness and subjectivism.

Moroz: Why is parliament involved in creating a social organization?

Shorin: It will be a state-social organization. Why should the state be involved in that? As everyone knows, we have the basic sciences. All applied scientific-technical developments are based on them. And the basic sciences largely determine the social development of society. Throughout the world, the basic sciences are financed by the state. Clearly, then, an objective mechanism for distributing finances is needed. To ensure objectivity, the state needs some kind of adviser. The academy of sciences is called upon to play that role.

Moroz: There are a huge number of examples in which academy studies have issued erroneous recommendations. Take just the notion of diverting rivers. Or the assurances of the safety of the construction at the Baykal Paper and Pulp Plant. In essence, the study commission issued the recommendations that the state officials wanted. How could it be any different? After all, the state feeds the academy.

Shorin: That's all beside the point. We want to create an organization that is different from the existing academy. We are establishing totally new organizational principles. According to our concept, the Russian academy will not be a ministry of science, as is the Union academy of sciences. Since it will be a society of scholars with

different departmental affiliations, it will be more independent from the power of the wealthy and more objective in its decisions.

Moroz: An academy of sciences as a form of organization of scholarly activity is an invention of the 17th and 18th centuries. In the 19th century, it was already ludicrous. Recall Pushkin's words:

In the Academy of Sciences

Sits Prince Dunduk.

Such an honor, they say.

Doesn't suit him.

So why is he there?

Because he's there.

At the end of the 20th century, all this is, of course, profoundly archaic and illogical.

The biggest absurdity is the lifetime election to the academy. Even if an individual has certain merits when he's elected, he shouldn't be able to live on that his whole life, all the way to his death. Time goes by, the individual changes, and often not for the best. His talent wanes (if it existed at all), his efficiency diminishes, but he's still an academician. He is by definition the "most outstanding" (what a formula!). And you wouldn't be able to convince anyone that some other individual who isn't an academician or a corresponding member is better, head and shoulders above someone who, at some time in the past, for some reason or other, got into the academy. What's more, when the academician realizes that he is deteriorating little by little, he begins to vigilantly see to it that no one capable or more talented is around him. And since, as a rule, the academy chooses its own—new members are chosen by old members—it's rather easy to oppose the entry of bright, young individuals. Academicians live a long time (they have special food privileges, special medical care, etc.), and it's rather difficult for those who are talented and gifted and those whom they don't favor, to outlive them. And so the academy is something that by its very nature represents the obstruction and restraint of progress.

Shorin: There is a great deal of truth in what you say. But you're speaking about those who are already in the academy, and I want to talk about those who haven't been chosen yet. Remember what Carnegie said: you shouldn't curse people; you should praise them, encourage them, support them, play on their ambition, urging them to do more. What's wrong with a scholar trying to get into the academy? After all, for him it represents something of a future, which is an additional incentive. And if he is actually chosen to be an academician because of his scholarly achievements, what's so bad about that? It works that way in other countries. Germany, for example, has the Max Planck Society; England, the London Royal Society; the United States,

the National Academy of Science; France, the consolidation of five academies, called the Institute of France.

Moroz: Well, those academies weren't created recently—they're a product of history. In their own country, every one of those academies is the target of the same kind of criticism that is levelled against our academy: they're archaic, patriarchal, feudalistic. And here you are creating an academy today, and you people are contemporaries of ours, not of Peter the Great. And not even of Stalin, who liked very much that type of scholarly institution and who planted one in every republic.

Shorin: The criticism notwithstanding, academicians nevertheless exist in Western countries. And if that's so, that means that there's a need for that kind of thing, there's a specific rationale.

Moroz: As for incentives, real incentives should be used to encourage people, not false one. And real incentives do exist. Like getting articles published in prestigious journals, both here and abroad. Like having a high index of citations in the literature. Like having a high rating among specialists—that same Hamburg tally. But the rank of academicians of the Russian academy doesn't really tell us anything, except that new academicians are springing up now like mushrooms after a rain—there's the Russian Academy of Natural Sciences, there's the Russian Academy of Engineering Sciences, there's the Russian Academy of Agriculture. In terms of academicians per capita population, we're ahead of the entire planet. Just like in ballet.

Shorin: Why do you consider the awarding of academic ranks to be a false incentive? Ranks don't exist just in science, and society is quite happy to accept them. What's wrong with a wide circle of people knowing about a scholar's achievements, as opposed to just a few specialists knowing? It's understood that the true significance of the rank of "Russian academicians" will depend on the deeds of the future academy.

Moroz: You are about to create a system of incentives on a profoundly provincial level. It doesn't matter that you're awarding a seal of approval based not on world standards, not on competitiveness, but on local or departmental criteria—after all, that's how we've always done it.

Shorin: In the final analysis, to avoid provincialism, we could elect people to the academy after taking the opinions of foreign scholars into account. What I do not understand is this: how is awarding an academic rank on the basis of actual scholarly achievements worse than, say, on the basis of being cited often in the literature?

Moroz: What a comparison that is! The index of citations reflects the work you've done over a given period—say, over a year. To achieve that same level the following year, you have to maintain your scholarly form, you have to work. But once you become an academicians, you don't have to do anything anymore—and you'll remain an academicians till the end of your days.

Shorin: Well then, you can establish another principle—election to the academy for a certain period of time.

Moroz: Now just who's going to let you do that? Lifetime membership is the very first principle of the academy. A society consisting of people elected to it temporarily is no longer an academy, it's something else.

Shorin: No, everything depends on us. We have already partially put that principle in place: upon reaching a given age, members of the academy are transferred to honorary status.

Moroz: One sharp-witted individual who lived in the tsarist times said that the difference between an academicians and an honorary academicians is the same as between Your Majesty and Sir (he himself remained an honorary academicians to the end of his days, something he suffered a great deal from). But in the Soviet times, we have learned well how to overcome such distinctions. I have no doubt that, within a short period of time, the word "honorary" will be thrown out by the Russian academy. You won't be allowed to implement such innovations and revolutionary ideas. You would, after all, be creating a precedent. And in the USSR Academy of Sciences, someone would want to turn all the impotent old people into honorary academicians.

Shorin: Yet another unusual and, in my view, progressive principle that we have is that the members of the academy must be chosen by the scholarly community itself. That is, they are elected from below, not from above. That innovation is of great significance.

Moroz: Are you talking about the elections of the initial membership of the academy?

Shorin: Not just the initial elections—subsequent elections, too.

Moroz: But in subsequent elections, it will again be the academicians themselves who do the choosing.

Shorin: How the elections will be conducted needs to be formulated in the academy's charter.

Moroz: But that's how it is formulated. I mean, in your "Basic Principles" for setting up the academy, it's already written that "elections of members of the Russian Academy of Sciences are held in a general meeting of scholars of regional departments.... Results of the election are confirmed by a general meeting of the Russian Academy of Sciences."

Shorin: "Scholars of regional departments" who take part in the elections are not academicians working in a region. We examined the most varied of types of elections. The rating principle, for example, may be used. A vacancy for a chemist, for example, is announced. Candidates are nominated in each region. Two or three candidates in each. All of them are combined into one list, which is sent around to all the chemists in the Soviet Union and all doctors of science, who are asked to arrange them in order of scientific worth. The lists that

are thus compiled are sent through a computer, which then gives us a rating for each candidate. Then a more painstaking appraisal is made of the first ten, and the individual most suited for the rank of academician is identified. It's a completely democratic procedure, wouldn't you say? And there are other procedures, too.

Moroz: But the very worst procedure will be adopted, you wait and see. Because these days, it's the talentless, not the gifted, who need the academy. The gifted themselves realize that, and without the benefit of any academic titles.

Shorin: You think so? I don't know, perhaps. I may be romantic, but I still think that there will be a lot of talented people in the academy. The main thing right now is to lay out sensible principles for its organization.

Moroz: Don't you think it will be mainly second- and third-rate scholars who get into the Russian academy? Don't you think the academy will be rather weak in terms of its membership?

Shorin: You yourself wrote that there are a lot of talented scholars who can't get a good position. And those are the people to whom we will open the doors to the Russian Academy of Sciences.

Moroz: According to your concept, "talented youth from Moscow, Leningrad, and other major centers will go to fill vacancies that spring up in Yakutiya, for example, or in other remote regions." There you have one of the channels through which the mediocre get in. Look, the very same thing is happening right now in the "big" academy: regional vacancies open up, people who, here in Moscow, aren't in any "spotlight" go to Siberia, or the Far East, and there, because of an easier procedure (no competition), they become academicians and corresponding members, after which they return to Moscow. What kind of "local" development of science comes from that?

Shorin: Every organism reproduces similar organisms for itself. The "big" academy produces regional structures that are the same as itself. But after all, the new academy will be set up along totally different principles. If we assemble a pure group, it most likely will function according to different laws.

Moroz: Can you name just one function, from among those you are assigning to the academy, that couldn't be performed without an academy of sciences?

Shorin: Maybe separately, those functions—studies, prediction of the development of the sciences, arrangement of the priorities of certain scientific areas, the training of personnel, publishing, etc.—could be performed without an academy. But the consolidation of them all under one academic roof will give rise to a new level of quality.

Unlike existing academies, the Russian academy will not have its own institutions. We have uncoupled science and administration. The academy's system of administration will be small—20 or 30 people.

Moroz: That's in the beginning. Then, I guarantee you, it will begin to grow. Certain new needs will come up that will absolutely have to be satisfied. A garage will appear, then recreation centers, then creativity buildings, and so forth, and so forth.

Shorin: Our concept of the academy includes principles that prevent the growth of the administrative system. Since an academy member will be working not in an isolated academy system, but in an institution such as a university, a sector scientific research institute, or an association, he will make use of the social benefits of only the organization where he works. And that's why there won't be any academy recreation centers or polyclinics. I must emphasize again that the Russian Academy of Sciences will be a society of scholars, with a minimum of the administration that generally produces various management annexes that inflate the staff.

Moroz: I can understand why academicians need recreation centers and polyclinics. But as I've been saying, I don't understand why the academy itself is needed.

Shorin: If there's a demand for organizations such as academies of sciences, then they have a right to exist. Society is demanding the creation of the academy. And a whole society can't be foolish.

Moroz: You're wrong. There may be a huge number of intelligent people, but society as a whole is quite a foolish entity. Especially a society like ours.

Shorin: It's foolish, perhaps, just sometimes.

Moroz: The Russian Academy of Sciences is being created primarily as a symbol of the state system: the other republics have academies, but Russia doesn't. In fact, it's all extraordinarily absurd: under Stalin, they started creating these Potemkin villages, the academies; and now we're forced to bring that process to its "logical conclusion." Why can't Russia walk away from this absurd tradition and say, "We don't need an academy, and we're going to develop science in modern, not archaic, forms"?

We need to re-form science, focusing on the creative individual and the place where he works—the laboratory, the observatory, etc.—instead of piling up artificial structures. The highly gifted individual should be in basic science, and he needs to create all the conditions ensuring that. Expending manpower and money on scientific-bureaucratic superstructures won't bring us any discoveries.

Shorin: The proper conditions are needed not only by the individual scholar, but also by the scholarly community as a whole. Our concept, I feel, solves that problem: without creating an unwieldy bureaucratic superstructure, we are helping scholars unite so that they can do their research more effectively. Everyone knows that it's always easier to do something together than it is to do it alone.

Discussion Supports Independence

917A0092D Moscow IZVESTIYA in Russian 28 Feb 91
(Union edition) p 3

[Article by USSR Academy of Sciences Academician G. Tolstikov and USSR Academy of Sciences corresponding members V. Kazakov, Yu. Monakov, V. Napalkov, and O. Chupakhin: "Is Our Own Academy Closer to What We Need?"]

[Text] The 7 February ukase of the Presidium of the Supreme Soviet of Bashkortostan on the establishment of an academy of sciences for the republic makes it possible for the scholarly community to begin the process of creating academy-level science in the republic and, quite possibly, to build something more advanced than the existing academy structures in the country. The organizing committee, which was set up by a decree of the republic's council of ministers, faces some difficult work, especially because an extremely brief period of time has been allotted for organizing the academy. The first general meeting of the academy is to take place as early as March or April. The concept and a draft charter have to be developed, and, most important, the membership of the academy has to be drawn up.

We feel that the candidates for charter membership of the academy should be determined at a general meeting of the scholarly community of the republic, which would include all doctors of science and all major specialists from the national economy, education, and culture. For example, in Bashkiriya, there are more than 300 doctors of science who, if broken up into several large groups by specialty, would be able to resolve democratically all the issues, including the organization of the agency to handle elections.

This scholarly organism is delicate and brittle, and any operations on it should be performed in all their importance by high-level professionals. And at this point, we need to return to the above-mentioned ukase of the Presidium of the Supreme Soviet of our republic. Unfortunately, it unthinkingly expresses claims for the property of the Union academy, which is protected by the Ukase of the President of the USSR.

Why bring up that question at all? The institutes of our center [Bashkir Science Center] have large science schools that have Union-wide and worldwide reputations. Strong, long-term cooperation has been established among the subdepartments of various specialties, and relationships that have given birth to new scientific areas have been forged and continue to be strengthened between the sciences. A unique, multinational community has developed, and it works in an atmosphere of friendship, mutual respect, and support. The chief criterion for the work done in all five institutes and three departments of the science center is high quality of creative product. Recently held elections to the USSR Academy of Sciences, which concluded with the selection of four scientists from the center as USSR Academy

of Sciences corresponding members, put Ufa among the top ten major cities in the country with advanced academy-level science.

In an address to the leadership of the Presidium of the USSR Academy of Sciences, the scientists of the Bashkir Science Center emphasized that the establishment of the Academy of Sciences of Bashkiriya should not be based on the destruction of USSR Academy of Sciences structures that are working well. Reorganization of the center into the Academy of Sciences of Bashkiriya could have irreversible destructive consequences and could result in irrecoverable losses for the center. They were speaking of the destruction of the science schools, the disruption of scientific ties both within the country and abroad, the siphoning off from the republic of highly skilled individuals (chemists, mathematicians, biologists, economists), and the closing of a number of areas of basic research because of inability to finance them from the local budget.

The influx of professionals to the new academy of sciences should be the result of its attractiveness and freedom of creativity, and the academy should be based on coercion. Science, like art, is very delicate and needs careful handling, without the repetition of the dramatic mistakes that were made in the past. Any republic expects anew scientific organization to be just as respected and to enjoy the same kind of authority both in the country and outside it as does the USSR Academy of Sciences. Of course, science has no boundaries, and the fundamental laws of nature have no state or national affiliations. But all regional departments of the Union academy are known to provide a great deal of resources in solving problems that are of interest primarily to the regions themselves. The Bashkir Science Center is no exception.

The task of the new academy is to develop the areas of research that are not yet meeting the needs of the national economy to a great enough extent or that have not been covered at all by the existing scientific potential of the republic. Proposals have already surfaced in the local press about the organization of an institute of mineral resources. We feel that a petrochemical and industrial ecology institute is needed. And, of course, all forms of the humanities research addressed directly to the spiritual world of the peoples inhabiting the republic should be ever so widely represented.

Meanwhile, it is understood that the government of the republic will determine the number of institutes and their specialties on the basis of their financial capabilities. But one would hope that an industrially developed region known for its petrochemical and machine building complex would find the capabilities for proper financing of the republic academy. It is the duty and the moral responsibility of the Union academy of sciences and the Bashkir Science Center to help the new academy in every way possible to get on its feet and grow strong, and we must also help it to train its personnel. That is,

we must do everything possible to raise a worthy "competitor" in the world scientific arena for friendly cooperation in the interests of common concerns. All 60 doctors of science and the six USSR Academy of Sciences corresponding members who work at the Bashkir Science Center are ready to take a very active part in setting up the Academy of Sciences of Bashkiriya, whose members should be the cream of the crop. The institutions of the USSR Academy of Sciences are fully resolute about directing their scientific potential to work out as quickly as possible the most important of the republic's scientific, cultural, and social programs.

Argument Against Independence

917A0092E IZVESTIYA in Russian 28 Feb 91 (Union edition) p 3

[Article by Kim Smirnov, under the rubric "Commentary by IZVESTIYA Science Reviewer": "Is Our Own Academy Closer to What We Need?"]

[Text] The authors of the letter object to the integration of the newborn Bashkir academy and the Bashkir Science Center of the Ural Department of the USSR Academy of Sciences. They are for a republic academy of sciences, but one set up on its own, independent of the structures of the USSR Academy of Sciences.

But I'd like to counter with this question: Does Bashkiriya need a weak academy of sciences, just to have one that is absolutely its own, "sovereign" academy of sciences? After all, from everything that was said in that letter, it would seem that the existing republic center that is part of the Ural Department is itself capable of solving all the science-related problems of the region in a satisfactory manner.

If the aims and objectives of the scientists working here were different from the interests of the Bashkir people, then, of course, go ahead. But can the republic leadership and its Supreme Soviet assume that?

A report appeared in one newspaper under the rubric "Opinion of the Bashkir Congress," and it said that that congress of the Bashkir people responds with a unanimous yes to the question appearing on the All-Union referendum: Should there be a renewed Soviet Union? And at the same time, at that same congress, "the question was also raised about how it felt about the creation of an Academy of Sciences of Bashkir SSR. The congress censured the attempts of the leaders of the Ural Department of the USSR Academy of Sciences and its Bashkir Science Center, academicians G. Mesyats and G. Tolshtikov, to block the creation of the academy of sciences of Bashkortostan with the far-fetched, completely unconvincing argument that, they say, the facilities of the Bashkir Science Center belong to the USSR Academy of Sciences, and therefore, according to them, cannot be transferred.

But after all, if the question had been framed as it was in the newspaper, then that would mean it was posed

against common sense, against the decisions and actions of the Union as a whole. After all, the argument in question is not at all "far-fetched or completely unconvincing." It is strictly in line with the Ukase of the President of the USSR M. S. Gorbachev—"On the Status of the USSR Academy of Sciences"—which, by the way, asserts the sovereignty of science and its independence both from Union and local government structures.

There is no such thing as Moscow science, or Nizhegorodskiy science, or Ural or Bashkir science. It's all the same science, or it's not science at all. That's the long and the short of it. And we'd be going too far if we chose the academicians at sessions of the supreme soviets or even at the people's congresses that I so respect.

Yes, if we scatter things about in national burrows and certain principalities, then of course we would have to drag the common research capital around from burrow to burrow. It would be a pity, of course, because in our century, it is science, more than any other social structure, that has demonstrated an international, worldwide brotherhood (recall just the students from around the world in the Rutherford Laboratory in Great Britain or our Leningrad "Papa Ioffe school").

But aren't we burying a little early our worldwide tradition, and our unity?

We're impatient, though. And it isn't daily, but hourly, that, like mushrooms, more and more new academies are springing up across the country. And it's with a surprising haste, which is evoking just this kind of response from serious scholars:

To the first deputy chairman of the RSFSR Supreme Soviet, R. I. Khasbulatov, concerning the Russian Academy of Engineering Sciences

Dear Ruslan Imranovich,

Elections to the academy took place on 14 February in the Russian Academy of Engineering Sciences. I was officially informed of the elections by a telephone message to the USSR Academy of Sciences Institute of General Physics only when the voting had ended

In complete contradiction of the announcement that appeared in the 4 January 1991 issue of the newspaper IZVESTIYA, the elections were held not according to the academy charter adopted at the general meeting, but according to a provisional statute worked out by the academy's presidium. The provisional election statute was never discussed with me. The changes in the membership of the presidium that was selected at the general meeting were not submitted to me for approval, and I wasn't aware of the mechanism for forming a new presidium. In particular, I was not informed of the fact that I am not part of the new presidium. As far as I know, the question of changing the membership of the presidium was not raised at the general meetings of the academy. I

also know nothing of the membership of or the mechanism for forming the competitive commission of the academy.

In connection with the above, I feel it necessary to announce that I cannot continue as honorary president of the Russian Academy of Engineering Sciences.

Academician A. M. Prokhorov

Typically, that event took place after the 11 February signing of the decree of the Presidium of the RSFSR Supreme Soviet "on Certain Questions of the Use of the Name and Logo of the RSFSR." The decree said that the processes of democratization taking place in the republic had, at the initiative of the public, resulted in the creation of various scientific associations such as the "Russian Academy of Education and Culture," the "Russian People's Academy," the "Russian Humanities Academy," the "Russian Academy of the Natural Sciences," etc.

Being registered in local organs of state authority, those kinds of associations, by their titles, claim their activity to be of an all-republic nature and are using the republic logo on their paperwork (the republic emblem on forms and printed pieces). The activity performed by those associations does not correspond to their names, and their conferral and use of academic titles is illegal.

It has been recommended to the RSFSR Ministry of Justice, its local organs, and the local soviets of people's deputies that associations re-formed by initiative and using the combination of words "Russian Academy" not be registered. It has also been recommended that the associations that used that word combination and the Russian logo be reregistered. Associations that are newly created or re-formed by initiative are forbidden to use and confer upon their members the title of "academician."

Yes, more often than not, the desire to have an academy in every region, in every department, is motivated by the authors of such projects who are moved by good impulses for freedom, equality, and brotherhood and for the destruction of Union academy of science structures that have grown stiff. But in this case, behind the most revolutionary phrases, much too often there hides an old, hardened logic every bit as the command-administrative system. Do you remember how stubbornly yesterday's "bosses" of krays and oblasts and autonomous republics strove to make sure that they had their own university, and even if it didn't have a single doctor of science or the most elementary material base, it was still their own little "pocket" university? Are we in pocket enough these days to afford all these dozens of "pocket" academies?

Establishment of Estonian Engineering Academy Recommended

917A0108A Tallinn SOVETSKAYA ESTONIYA
in Russian 14 Feb 91 p 3

[Article by Doctor of Technical Sciences L. Volgin, professor of the Institute of Cybernetics of the Academy of Sciences of Estonia: "Is the Engineering Academy To Be?"]

[Text] Science is the intellect of society, art is its soul. In contrast to art, science through engineering creativity directly affects the productive forces of society. For the development of science academies of sciences and the corresponding network of academic institutes, which are financed at the state level, were established in the country and the republics. Here it is presumed that the system of departmental institutes and design organizations carries out the introduction of scientific achievements in production.

The drawbacks of such a system are well known, the main ones of them are departmental isolation, the lack of coordination of the creative efforts of engineers even within one specialization, the lack of information on the creative potential of some groups of development engineers or others, the impossibility of concentrating efforts in promising directions on the introduction of valuable scientific and engineering ideas, and the dispersal of engineering and material resources.

In my opinion, the effectiveness of engineering creativity at the republic level can be increased substantially by the establishment of the Engineering Academy of Estonia (IAE). Of course, here a question arises: Where is one to get the money for the budget financing of another creative association? But I and the people holding the same views as I are certain that the Engineering Academy of Estonia should exist on the basis of cost recovery and cost accounting.

What do we see as the goals, tasks, and principles of the organization of the Engineering Academy of Estonia? Such an academy can be a nongovernmental public organization, of which talented engineers and prominent scientists of the republic become members on a voluntary and elected basis. The organization determines the prospects and formulates programs of the scientific and technical development of the production sectors of the national economy of the republic, ensures the independent examination of scientific and technical projects (including the determination of their competitive ability on the foreign market), sets up and supervises temporary creative groups made up of leading engineers and scientists of the republic for the development of science-intensive items and their introduction at industrial enterprises of the republic, forms consultative groups for the types of republic industrial sectors, participates in the training of scientific personnel of the highest skill, in the retraining and the increase of the skills of engineering personnel, and in the certification and accreditation of technical higher educational institutions of the republic,

makes an analysis of the state and the trends of development of invention activity in production sectors, creates information banks of data on discoveries and inventions and provides assistance in introduction, holds sectorial, republic, and international conferences on scientific and technical problems, establishes direct ties with various organizations (including foreign organizations) and participates in their work, publishes reference, information, scientific, and educational methods literature, and so on.

The engineering academy could establish and include in the sphere of its activity with the right of a legal entity various enterprises and organizations, experimental engineering and technical centers with a republic status, problem laboratories, creative collectives, and commissions for the solution of individual problems and projects.

In addition to several departments, it is possible establish under the engineering academy an Industrial Council, to which representatives of leading industrial, planning, and research enterprises and organizations of the republic would belong.

Let us note that the first engineering academy in the world was established in 1919 in Sweden and at present enjoys recognized authority. Last year the USSR Engineering Academy was established, organizational work on the establishment of the RSFSR Academy Academy is being performed.

From the Editorial Board

Thus, the suggestion has been made. Its practical implementation depends only on the support of the scientific and technical community of the republic. The editorial board asks readers and potential founders to express their opinion on the question raised in the title of the article.

New Regional Scientific Institutions Established

Belorussian Engineering Academy

917A0095A Minsk SOVETSKAYA BELORUSSIYA
in Russian 10 Jan 91 p 3

[Interview with Academician of the Belorussian SSR Academy of Sciences Viktor Chachin, president of the Belorussian Engineering Academy, and Professor Vladimir Koleshko, vice president of the Belorussian Engineering Academy, by BELTA correspondent A. Volvachev, under the rubric "A Topical Interview"; date and place not given: "An Academy for Belorussian Engineers"—first two paragraphs are SOVETSKAYA BELORUSSIYA introduction]

[Text] The Belorussian SSR Ministry of Justice has registered the charter documents of the Belorussian Engineering Academy. Fifty republic associations, institutes, and enterprises were its cofounders. The new cost accounting scientific production structure proposes to

engage mainly in applied development on the basis of economic contracts and in the search for business partners, who are interested in the introduction of original inventions and information technology. The training of highly skilled managers and specialists in the study of the market, small and joint business, and the organization of production under the conditions the market economy is in its sphere of interests.

A BELTA correspondent met with Academician of the Belorussian SSR Academy of Sciences Viktor Chachin, president of the Belorussian Engineering Academy, and Professor Vladimir Koleshko, vice president.

[Volvachev] What does a "cost accounting academy" mean, for science in our country was always financed by the state?

[Chachin] This means that our academy will not receive a single ruble of subsidies from the treasury. Its collective and individual members are completely independent, and in the activity of the scientific engineering schools, laboratories, temporary creative collectives, small science-intensive enterprises, and innovation banks, which are established by them with the assistance of the Belorussian Engineering Academy, they are guided by their own interests. For example, scientists and engineers, in proposing programs of long-range research and applied development, will obtain financing for their implementation on a competitive basis, both from the assets of the Belorussian Engineering Academy and through state orders and from individual enterprises and private individual (including foreigners) under economic contracts. For the performance of this work scientific production and innovation centers and firms and research laboratories, which are based on the state, collective, joint-stock, and private forms of ownership, can be opened under the academy.

The Belorussian Engineering Academy will also cooperate actively with all organizations, which are capable of influencing the pace of scientific and technical progress in the republic and the increase of the social status of scientists and engineers.

[Koleshko] Incidentally, even the remuneration of the labor of the intellectual aktiv—full academicians, who are elected every five years as representatives of institutions—will be effected from the profit of the scientific production structures that have been formed by them under the Belorussian Engineering Academy. If the work is poorly organized and there is no revenue, there are also no academic structures. In principle, any engineer, who has interesting ideas, can organize his own "business": recruit a staff with the rights of the director, find sources of financing, and derive a profit, by selling the scientific product in the USSR and abroad. True, first he should join the engineering academy.

[Volvachev] And what are the conditions of admissions?

[Koleshko] It is sufficient for the engineer-innovator to pay the admission fee of 5 rubles [R]. After which he can

count on adequate support in financing, licensing, marketing, and the organization of work. He will be invited first of all to join the staff of temporary creative collectives and permanent scientific engineering structures. In this way we are creating the necessary reserve of the academy, a kind of register of talented personnel.

[Volvachev] But there are also founder-collectives....

[Koleshko] A prescribed fee, the amount of which is directly dependent on the number of engineering and technical personnel at the enterprise—from R5 to R50—is envisaged for the founders. Incidentally, our authorized capital stock will constitute the so-called scientific engineering fund of Belorussia, which is being established for the support of innovation enterprises and funds, science-intensive scientific production structures, and talented specialists. After all, why hide it: With the passage of law on departure the outflow of talented people abroad is inevitable. Therefore, at home it is necessary to create for them normal conditions for work and to reward their labor in a fitting manner.

[Volvachev] And what conditions does the Belorussian Engineering Academy propose?

[Koleshko] Remuneration depends on the real labor contribution and is not limited to subjective "ceilings." For example, we will try to see to it that the author of a development in case of its series assimilation would share in the profit, the percentage of which is stipulated by the contract.

[Volvachev] But our economic legislation does not make provision for payments of this sort....

[Chachin] In this case it is a matter not even of a new type of wage for us, but of the recognition of the right to intellectual property, that is, a "copyright," which also presumes payment for the "reprinting" and duplication of a development. This is a serious problem, and it should be solved at the parliamentary level.

[Koleshko] Everyone knows the example of Hungarian engineer Rubik, whom his original puzzles helped to become a well to do person. Our discoveries for decades have been appropriated and exploited by the state, the occupation of engineer has been degenerating into the labor of a manager-overseer. It is believed that everyone in our country can and should become inventors. Incorrect. Just as everyone cannot be composers, artists, and poets, so it is not given to everyone to be an inventor. This is a special gift!

[Volvachev] If your plans are implemented, the Belorussian Engineering Academy will constitute serious competition for the operating Belorussian SSR Academy of Sciences.

[Chachin] I do not think so. The Belorussian SSR Academy of Sciences, it seems to me, is even interested in the appearance of such a partner as the Belorussian Engineering Academy, which is oriented mainly toward the fulfillment of applied engineering projects and the

combining of science with production. Precisely a partner, for the achievement of a high level of applied development is impossible without basic research. Moreover, it is well known that a large number of interesting works, which for various reasons have not received practical realization, are preserved "on the shelves" of the Belorussian SSR Academy of Sciences. Why not revive them by joint efforts?

[Koleshko] Moreover, we have different "weight categories." The Belorussian Engineering Academy does not intend to establish gigantic research institutes, the basis of its activity is dynamic small enterprises, laboratories, engineering and technical centers, firms, both permanent and temporary divisions.

[Volvachev] Independent foreign economic activity is also spoken about in the charter of the Belorussian Engineering Academy....

[Chachin] In cooperation with foreign colleagues and national and international organizations and foundations we also expect to ensure the currency cost recovery of the academy. For example, an engineering educational center, to which it is planned to invite foreign specialists in marketing and the organization of small and joint ventures to teach, is being established under the Belorussian Engineering Academy. In order to have the opportunity to pay for their labor in currency, we are initiating at the center special courses for western entrepreneurs who intend to work on the Soviet market. They need such a "campaign against illiteracy," inasmuch as it is very difficult for our potential partners to understand the complexities of Soviet economic legislation.

Through the Belorussian-Japanese Chernobyl-Hiroshima Society, which is contributing to the technical and technological support of programs on the elimination of the Chernobyl tragedy, we are establishing contacts with Japanese firms and their affiliates in Europe. Preliminary talks on cooperation with the national engineering academy of the United States and with engineering societies of Hungary and the FRG have also been held.

Estonian Chemistry Society

917A0095B Tallinn VECHEPNYY TALLINN
in Russian 13 Feb 91 p 3

[Article by Evald Elmann: "The Chemical Society of Estonia"]

[Text] On 14 February at 1100 the constituent assembly of the Chemical Society of Estonia is being held at the House of Engineers on Tynismyagi, 7. The board will be elected, the organizational structure of the society and the directions of activity in conformity with the new charter will be approved. Academician Julo Lillelt and other scientists will give reports. Professor Lauri Nijnisto of Helsinki Technical University will take part in the assembly of chemists. For detailed information call 44-09-97.

Khabarovsk Scientific Center

917A0095C Moscow SOVETSKAYA ROSSIYA
(1st edition) in Russian 1 Mar 91 p 2

[Article (Khabarovsk): "A New Scientific Center of the USSR Academy of Sciences"]

[Text] The Far Eastern Department of the USSR Academy of Sciences has been reinforced by a new scientific center. The elaboration of recommendations for the development of the economy of the region, ecological problems, and the examination of the designs of new construction projects are among the priority tasks of its research collectives.

Accomplishments of Kazakh SSR Academy of Sciences Summarized

917A0107A Alma-Ata VESTNIK AKADEMII NAUK
KAZAKHSTANSKOY SSR in Russian No 12, Dec 90
pp 26-31

[Article by A. A. Abdulin, T. B. Tursunbayev, and Sh. K. Ayteyeva under the rubric "Science for Production": "The Kazakh SSR Academy of Sciences for the National Economy"]

UDC 338.4.574

[Text] As is known, the republic Academy of Sciences is the leading basic research center in the Kazakh SSR. Within it are 33 scientific institutions, at which about 10,000 people work, of them more than 4,000 are scientific personnel, including 302 doctors of sciences and 1,907 candidates of sciences.

The spending on the conducting of scientific development is increasing annually. Thus, the amount of financing of scientific research work by means of budget assets in 1989 came to 39.3 million rubles [R], which is R4.4 million more than in 1985, and by means of assets from economic contracts—respectively R12.2 million and R3.1 million.

The material and technical base of scientific institutions is also being strengthened. During 1988-1989 in the range of R8.8 million of assets a year were allocated for facilities of science as against R6.0 million in past years.

The structure of the industrial potential of Kazakhstan, which formed over many years, was oriented mainly toward the development of the extractive (raw material) sectors of industry and the establishment on their basis of capacities for the processing of mineral raw materials. In connection with this the efforts of scientists of the Academy of Sciences were concentrated on the development of the theoretical principles of the prospecting of minerals, the solution of the problems of the comprehensive development of deposits, the processing of ores and industrial products of the metallurgical and chemical industries, and the commitment to production of byproducts on the basis of low-waste and waste-free

technologies. Subsequently the work in the area of catalysis and organic chemistry, the chemistry and technology of fertilizers, high-molecular compounds, oxidative ammonolysis, and the alkali hydrometallurgy of light metals underwent development. There are many recognized developments in the sphere of the agroindustrial complex, such as the scientific principles of the development of the solonchaks lands of Kazakhstan, studies of the flora and fauna of the republic, and research in the area of molecular biology, genetics, and the development of animals. In recent years the work in the area of the physical mathematical sciences, particularly information science, instrument making, automation, nuclear physics, the obtaining of new nontraditional sources of energy, and others, has become widespread.

In conformity with the principles of the economic reform and for the purposes of improving the organizational forms of the management of scientific and technical progress and increasing the effectiveness of the scientific developments, which are being introduced in the national economy, the goal program method of planning is being used, that is, comprehensive, goal programs of the all-union and regional level in the priority directions (in the area of the natural, technical, and social sciences) are being formulated. Such an approach is making it possible to concentrate the efforts of scientists and physical assets and equipment on the accomplishment of the urgent tasks of the development of the national economy and is ensuring comprehensive planning over the entire "science-production" cycle and the continuity of all the stages—from basic research to industrial application.

At the scientific institutions of the Kazakh SSR Academy of Sciences work is being performed within the framework of a number of all-union and republic programs and the comprehensive program of scientific and technical progress of the CEMA member countries, as well as on special-purpose assignments of union and republic directive organs as a whole on 572 themes. In 1989 the research on 22 themes was completed. There were proposed for practical implementation 210 completed jobs. Thus, more than 70 developments were introduced at enterprises of nonferrous and ferrous metallurgy, 40 were introduced at farms and organizations of the State Agroindustrial Committee, 11 were introduced at enterprises of the chemical industry and in mineral fertilizer production, and 22 were introduced in geology. As a whole in four years of the current five-year plan 585 developments were implemented, which made it possible to obtain an economic impact in the amount of R43.3 million. Annually the introduction of 26-28 jobs envisages the solution of problems regarding environmental protection and the protection of the health of the population. The results of research are being used extensively for the further development of metallurgy, chemistry, mining, biology, and agriculture.

Scientists of the Physical and Mathematical Sciences Department in recent years have implemented a number of major developments regarding scientific instrument

making and the automation of scientific research. Thus, for example, a number of unique mass beta spectrometers were devised on the basis of the prism optics of charged particles, which was developed by the Institute of Nuclear Physics. At scientific organizations of the country Auger spectrometers are being used successfully for the equipment of analytical physical ultrahigh vacuum installations for studying surfaces in the process of the stretching and heating of metal specimens and for layer-by-layer elemental analysis.

More than 20 instruments for obtaining electron microscope subjects like the Mikron-3 were produced for scientific research institutes of the country and were introduced. The use of these instruments made it possible to improve the quality of the subjects being studied, to increase labor productivity, and to ensure reliable biological protection of the operator when working with radioactive specimens and aggressive electrolytes. The economic impact came to about R600,000.

The mockup of an instrument, which is used for studying radiation-induced defects in semiconductors, was developed on the basis of the method of electron paramagnetic resonance-tomography, which was proposed by scientists of the Institute of High Energy Physics. At present the electron paramagnetic resonance tomograph instrument is being developed jointly with enterprises of the GDR in accordance with a program of international cooperation.

Hoisting gear for the purpose of performing work at a height was proposed for construction organizations. The gear may find application in the operation and repair of civilian and industrial structures. Its design is compact, has a low weight, and is easy to maintain and control.

We want to note that Kazakhstan scientists obtained the most appreciable results in solving the problems of the complete use of natural raw materials.

Metallurgical scientists established a number of original scientific directions, which made it possible on the basis of basic developments to increase substantially the technical level of production at metallurgical enterprises of the country. Thus, fundamentally new technologies of obtaining ferrous and nonferrous metals were developed and assimilated on an industrial scale: autogenous processes of the production of copper, lead, and zinc, which have been patented in a number of countries of the world; the gallamic method of extracting gallium from alumina-containing raw materials, which made it possible to organize at a modern level the production of gallium at five plants of the aluminum sector. The novelty of the technology is protected by more than 70 author's certificates for inventions. The development has been patented in 10 leading countries (the United States, Canada, France, Japan, the FRG, Great Britain, Sweden, and others), from which 23 patents were received. License agreements in the amount of more than \$1.0 million have been concluded with Hungary and the GDR.

Scientists for a number of years have been developing technologies of the obtaining of ultrapure metals by the hydrometallurgical method. The production of ultrapure lead and cadmium has been assimilated at enterprises of the country. Moreover, a technology of refining mercury to a high purity, which made it possible to obtain mercury with a content of metal impurities of 1×10^{-7} - 5×10^{-8} mass percent, was proposed.

In recent years a fundamentally new high-precision method of the quantitative determination of useful components, particularly colloidal and finely-dispersed gold in ores and concentrates, which was developed by geology scholars of the Academy of Sciences, has found extensive use at mines of the Kazzoloto Industrial Association and at a number of scientific organizations of the country. By means of this method it is possible to develop a waste-free technology of the cyanide-free processing of hard-to-dress and toxic ores, particularly of the Bakyrchikskoye and Vasilkovskoye deposits.

On the basis of recommendations of the Institute of Geological Sciences imeni K.I. Satpayev the prospect of the presence of petroleum and gas in the Zaysan Depression in East Kazakhstan Oblast was established. The recommendation on the evaluation of the presence of petroleum and gas and on the direction of exploration work in the Northern Aral Sea Area (the Kulandy-Zharlypesskiy Zone) was recognized as geologically and economically sound and was included in the plan of prospecting for petroleum and gas in the Aral Sea Region.

A map of the seismic zoning of the territory of the Kazakh SSR with a scale of 1:25000 was developed by the Institute of Seismology and was included as a component in a map of the same name for the territory of the USSR. A map of the comprehensive seismic micro-zoning of the territory of Alma-Ata and its suburbs (a scale of 1:25000) served as the basis for the formulation of republic construction norms on the development of the city. The total economic impact from the use of the map when drafting the master plan of the development of Alma-Ata for the period to 2000 is characterized by the decrease of capital investments by R587 million.

A number of scientists were commended with prizes for achieved successes. Thus, for the development and introduction of a set of methods for studying the composition of mineral raw materials associates of the Institute of Geological Sciences were awarded the prize of the Kazakh SSR Council of Ministers. Scientists of the Institute of Mining were awarded the same prize for the development and introduction of a technology of the mining of ores with an artificial roof of the load-carrying structure. For a series of works on the comprehensive study and development of the mineral raw materials of the Dzhezkazgan Ore Region associates of the institutes of geological sciences and mining were awarded the first Academician K.I. Satpayev Prize; for a series of works on an advanced computer technology of the prediction and evaluation of probable resources of ground waters

an associate of the Institute of Hydrogeology and Hydrophysics imeni U.M. Akhmedsafin was awarded the prize of the USSR Ministry of Geology.

A technology of the development of highly saline and alkaline soils for cereal and feed crops was introduced into agricultural production by soil scientists at a number of farms. The obtaining of full-value yields of cereal and feed crops during the first year of development without the preliminary leaching of the soils is the advantage of the new technology. Here the time of the vegetation of plants is shortened and the biological and food characteristics of product quality improve. In the Akdalinskiy Rice Area more than 30,000 hectares were assimilated for rice planting with an economic impact of about R2 billion.

The method of enriching the feed rations of cattle by the addition of bentonite and mineral substances, which was developed by the Institute of Physiology, was introduced at the Dzhetyskiy Industrial Complex for the Fattening of Young Stock. The method makes it possible to decrease the sick rate of animals, to improve the quality of meat, and to obtain additional weight gains of up to 20 percent per animal. The indicated preparations are also being used in the fattening of hogs, sheep, and poultry (the egg production of poultry increases by 9 percent, the weight of eggs increases by 1.5 percent).

At the Chimkent Hydrolytic Plant the industrial production of the preparation GLES for covering fruits and poultry meat with a protective film and for stabilizing the vitamins in feeds made from plant raw materials was organized (60 tons of the preparation were produced in a year).

At the Progress Scientific Production Association (Stepnogorsk) a technology of obtaining phosphatidylinositol from inexpensive plant raw materials was assimilated. The developed technology affords extensive prospects for the use of the preparation in membrane biotechnology and the cosmetic and medical industry and will make it possible to abandon purchases of the expensive preparation abroad. An interest in this technology has been displayed by a number of European states.

Under the conditions of the universal changeover of sectors of the national economy to cost accounting and cost recovery, when the production and social development of collectives of enterprises is made directly dependent on the end results, it was anticipated that scientific and technical progress should become one of the main factors of the economic growth and well-being of enterprises. However, during the past years of perestroika the lack of receptivity of sectors of the national economy to scientific and technical achievements has remained the same as before, which is causing considerable concern. According to the data of the State Committee for Science and Technology, 80 percent of the new developments are introduced at only one enterprise and just 0.6 percent are introduced at five and more. A significant number of completed jobs of an applied nature have not been

introduced anywhere, the situation with the introduction of inventions is also similar.

As before, enterprises for the most part are not interested in the introduction of highly efficient achievements of science, which requires the reorganization of the technological cycle of production, since the assimilation of a new technology at a given movement worsens the basic indicators of the activity of the enterprise and, consequently, decreases the economic stimulation funds. According to the data of the State Committee for Statistics, in the republic more than a third of the enterprises are not engaged at all in the introduction of scientific and technical achievements. The presently established rate of return of the enterprise for its use for retooling and the introduction of innovations is inadequate, and it is often used for the wrong purpose. As a result the technical level of many sectors of the national economy is practically not increasing, while fixed capital has much wear, as a result of which repair work takes up in industry one-third (for the USSR, 10 percent).

It should be noted that in the past two-three years (according to the data of the State Committee for Statistics) in Kazakhstan all the basic indicators, which characterize the results of the introduction of achievements of science and technology, have decreased appreciably. The level of fulfillment of the assignments of the Kazakh SSR State Plan in 1989 decreased as compared with 1986 by 5.8 percent. The profit, which was derived in 1989, decreased by 13.4 percent and came to R172 million. The share of the increase of labor productivity due to the introduction of scientific and technical achievements in the total increase of labor productivity also decreased and came to 19.6 percent as against 24.8 percent in 1986. These data testify that the "science-production" problem under the new conditions of management has been aggravated even more.

A big hindrance to the implementation of scientific developments of scientists of the Academy of Sciences is the negative attitude toward science of many union enterprises located on the territory of the republic, which formed over many years, as well as the inherent shortcomings in the work of the Academy of Sciences, the basic ones of which are:

- the low level of some scientific research efforts of an applied nature, on the majority of which patent research is being conducted formally and in inadequate amounts. At the Academy of Sciences questions of the financing of the stages of scientific research work are not linked with the quality of their fulfillment, the strict accountability of the directors of institutes, departments, and laboratories for the level of the research being conducted is practically absent;
- the low degree of completion of applied scientific research work and its preparation for practical use in the national economy of the country;
- the poor promotion of scientific and technical developments, about the majority of which the managers

and engineering and technical personnel of enterprises and organizations are poorly informed.

At present the Academy of Sciences is taking steps on the organization of interrelations with enterprises and ministries, has outlined means for organizing the acceleration of introduction, and has formulated a program on the reorganization of this direction of activity. A decision of the Presidium of the Kazakh SSR Academy of Sciences, in accordance with which the amount of financing of a stage of experimental design work is allotted by a separate line, has been made, the demands on the quality of the patent analysis of the research being performed are being increased.

A pilot experimental works of scientific and industrial instrument making has been organized under the Institute of Nuclear Physics jointly with the Kazakh Republic Association of Intersectorial Business Cooperation. The Kibernetika Scientific Technical Complex and the Ecological Forecasting Center have been established under the Institute of Mathematics and Mechanics; moreover, the Manipulyator Temporary Scientific Collective has been established jointly with the Eastern Department of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin, while the Mashinostroyeniye Scientific Engineering Center of Computer-Aided Design and the Mashinostroyeniye Scientific Technical Complex have been established jointly with the Kazakh Polytechnical Institute imeni V.I. Lenin.

On the basis of institutes of the Central Kazakhstan Department the Karaganda Scientific Production Association, to which the coordination of the scientific research, planning and design, surveying, and introduction work, which is connected with the efficient use of nature in the oblast, was established by the oblast soviet executive committee.

A coordinating center for the solution of the problems of the building of an ecologically clean works for the processing of high-sulfur hydrocarbon raw materials and an affiliate of the Kazekologiya Center of the Kazakh SSR State Committee for the Protection of Nature for the conducting of scientific research work on urgent ecological problems of Western Kazakhstan have been organized on the basis of the Institute of Petroleum and Natural Salts Chemistry.

During 1988-1989 scientific technical cooperatives, which assumed the functions on the devising and development of technologies, methods, and means of the production of materials and instruments for subsequent introduction were opened under several academic institutes.

Some steps were taken on the adjustment of the work of the existing pilot experimental base, a chemical metallurgical complex, which is called upon to serve institutes of the chemical technological type, is being organized. A number of consolidated units for the conducting of tests of flow charts, the obtaining of new materials, the production of powders of refractory compounds, and the

application of wear-resistant and protective coatings were established here. In the vacuum metallurgy section of the complex the installation of a unit for combined tests of the processes of the distillation refining of lead and the obtaining of selenium of high purity was completed. For the most part the installation of equipment in the sections of block and bead catalyzers, which are designed for the output of 5,000 catalyzers a year, was completed. In 1989, 200 catalyzers on block carriers were produced. Tests of them were conducted on benches of the Kazavtotranstekhnika Scientific Production Association, positive results were obtained, and tests of the catalyzers on Ikarus buses under the conditions of Alma-Ata were begun. The acceptance tests of block catalyzers on open-pit dump trucks of the Belorussian Motor Vehicle Works at the Dvigatel Scientific Production Association were successful.

The Presidium of the Kazakh SSR Academy of Sciences with allowance made for the suggestions of the Kazakh SSR State Planning Committee, ministries, departments, and oblast soviet executive committees of the republic drew up a list of the problems, in the solution of which it is necessary to enlist the scientific potential of the Academy of Sciences.

The promotion of the scientific and technical achievements of academic institutes was improved: The publication of the express journal NOVOSTI NAUKI KAZAKHSTANA with its dissemination throughout the country (a run of more than 1,000 copies) was organized; preliminary work on the publication of color advertising prospectuses was performed with the publishing house of the Central Committee of the Communist Party of Kazakhstan; the mobile Science for Production Exhibition with the display of the most important developments in the oblasts of the republic is operating.

The holding of field sessions of the Kazakh SSR Academy of Sciences, in our opinion, is one of the forms of bringing science closer to production. For example, the General Meeting of the Kazakh SSR Academy of Sciences with the participation of scientists not only of Kazakhstan, but also of the country, as well as leaders of the republic and representatives of ministries and departments, which was held in December 1989 in Guryev, made it possible to familiarize oneself in detail locally with the problems in the economy of Western Kazakhstan, to make more specific decisions, and to outline measures on the accomplishment of the problems of the development of the natural resources of Western Kazakhstan and the comprehensive and long-range solution of the urgent social and ecological problems of the region. A similar session was also held on the problems of the Aral Sea Region.

It should be noted that much work lies ahead on the development of the economic mechanism of the interaction of science and production so that the transfer to production of scientific and technical developments would be accompanied by financial reciprocal settlements, from which institutions would have additional

revenues. There are several possibilities here: These are the construction of their own pilot experimental plants with the output of products, the organization with enterprises of joint works based on academic developments with the transfer to institutes of a portion of the profit, the establishment of small-tonnage works for the output of small-series products, and the sale of the technologies or software, which were developed by scientists, and other forms of the realization of the results of scientific research work.

The overcoming of the negative trends in the development of science at the present stage is seen in the

improvement of the legal basis of the organization of science in the republic. A law, which would not only specify, but also regulate efficiently the conditions of the conducting and financing of scientific research and the procedure of the interaction of academic, higher educational institution (VUZ), and sectorial science with production, as well as would distribute efficiently the functions of the performers in the "science-production" chain, is needed.

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Market Economy Poses 'Danger' to Academy Science*917A0128A Moscow PRAVDA (2d edition) in Russian
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[Article by Academician V. Afanasyev under the rubric "Notes of a Scientist": "Science and the Market. The Reefs of an Independent Cruise. We Are Not Selling the Roof for Dollars. Where Minds Are Draining. The Storehouse of State Knowledge"—first paragraph is PRAVDA introduction]

[Text] The coming market holds for academic science a certain, I would say, serious danger. For it studies the laws and principles, which today, and at times for many years and decades, do not yield a practical return, while the market weighs all and everything on the scales of the profit and measures in money, especially if it is currency. Academic science is hardly compatible, if not to say entirely incompatible, with enterprise, commerce, and the play of the market forces of supply and demand.

At the same time without academic science society, particularly in our scientific and technical age, cannot function and develop normally. It is the basis and starting point of the applied sciences and new equipment and technology. It together with art is the heart of the spiritual culture of society and the repository of human values. It is the calling card of the country: People judge the prestige of a power in many respects subject to the level of its development and to what its state is today and what its prospects for tomorrow are.

I would also like to speak about another important function of science in our society. About the fact that science, particularly academic, basic science, is a supra-national, general social, common human phenomenon. Not the idea, be it a political, national, and especially a nationalistic idea, but the truth is its mistress. In our society, which is being torn apart by contradictions—economic, sociopolitical, national, and others—science is one of the important factors of consolidation, concord, and unity.

Thus we will take care of our science, especially academic science.

As is known, following the Ukase of the President "On the Status of the USSR Academy of Sciences" it became not a state, but an all-union self-managed organization, which operates on the basis of USSR laws and the charter of the academy without any interference of state and other structures. It independently ensures the efficient work of its subdivisions in the area of basic scientific research and the training of scientific personnel.

Although the academy declares itself to be a self-managed organization, it is inseparably connected with society and the state. The special-purpose financing of basic scientific research of the USSR Academy of Sciences from the state budget remains. Moreover, the state

is forming the all-union state budget basic research fund. At the same time the academy transfers the results of this research free of charge to the state with the observance of the norms of copyright and invention law.

Yes, the academy will henceforth specify the priority directions of the development of science and its own structure and functions and will establish the degree of its own freedom and responsibility and its own rights and duties. But it cannot and ought not but take into account the economic and social effectiveness of scientific research, its ecological safety, its promise, and its orientation toward the future. It is called upon to serve the people and society, which have the right to ask scientists what they are doing and for whom. While this means that independence from the state does not abolish state regulation of the development of science and technology, not excepting academic science.

That is how, strictly speaking, it is also done in developed capitalist countries, and the market is not an obstacle to this. The governments of the United States and Japan, France, the FRG, Great Britain, and any other developed country with a market economy do not let go for an instant of the threads of management of the development of science and technology and keep the most important scientific and technical programs under strict, unrelenting control.

I would call the Ukase of the President a "safe conduct," which shields the academy from the vicissitudes of the market. Without the comprehensive material and financial assistance of the state and its support and attention academic science cannot exist.

How much, for example, might historical, ethnographic, linguistic, literary critical, philosophical, and many other studies of humanities scholars and social scientists cost on the market? In dollars and rubles, apparently, not much at all. But they, just as all academic science, are invaluable, inasmuch as they form in Soviet people a high culture, without which democracy is impossible.

The question of property, its removal from state control, the pluralism and equality of its forms, and their rivalry and contention is the primary question of the change-over of the country to a market economy.

The removal of state control over academic property and the transfer of the fixed capital and other state possessions, which at present are being used by institutes, laboratories, enterprises, and organizations of the USSR Academy of Sciences, to its exclusive ownership are envisaged by the Ukase of the President.

To all appearances, this Ukase will be up in the air. The Russian Soviet Federated Socialist Republic (RSFSR) Supreme Soviet suspended the part of the Ukase, which concerns the property of the union academy on the territory of Russia. It seems to be clear: Everything that is on the territory of Russia is the property of Russia. But even in this case it is not clear, who is called upon to be the owner of what the USSR Academy of Sciences is

using? But if the country is prepared to change over to a market economy, we should not avoid the problem of the privatization, the removal of state control over academic possessions.

But here is the question, the primary one, the most vital one: To whom are this property and these possessions to be transferred? It is ruled out to transfer them into private hands: Academic science and private property are incompatible. The transfer of the property to the leadership of the academy, to its presidium is also ruled out, inasmuch as in this case the army of scientific personnel will, like now, be alienated from property.

One solution is seen—to transfer the fixed capital and possessions to the ownership of the collectives of institutes and other organizations of the academy. It is necessary to think over carefully how to do this and when, but one must not lose precious time.

Just one example. Readers, radio listeners, and television viewers undoubtedly remember how many poison arrows were shot at the complex of buildings of the USSR Academy of Sciences on Gagarin Square. I will not talk about their pomposity, ridiculous architecture, and so on. All this has been told about and shown "brilliantly." But the tellers and showers forgot that this complex was designed a quarter century ago according to the standards of the megalomania of the Khrushchev and Brezhnev times, that for 10 years construction was halted, and that the present leadership of the academy has very little to do with all, as they say, "the foregoing."

And all the same just recently the first section of the complex of buildings of the USSR Academy of Sciences was declared ready. How is this complex to be used?

It would be possible, of course, to act along purely market lines. To sell or, at worst, to lease the buildings to foreign companies and to earn millions of dollars on this. It is a tempting suggestion, is it not? Especially as the academy is experiencing an acute shortage of currency. The Philosophy and Law Department, for example, receives just 6,000 foreign exchange rubles a year. But in it there are five large basic institutes and about 10 other scientific organizations, which are living in poverty under the yoke of the department without rights.

And all the same the presidium of the USSR Academy of Sciences was not tempted by millions of rubles. It decided to transfer 14 of the 19 floors of the new building of the academy to its humanities institutes. Together with them mathematicians from the Institute imeni V.A. Steklov, the associates of which for 70 years did not have their own premises, are moving here. It is an excellent union: After all, it was K. Marx who said that only the science, which is capable of speaking the language of mathematics, is perfect.

In this case a market, fortunately, did not appear.

But academic science will not succeeding in getting rid of the market. The Moscow City Soviet intends to increase

by many fold the rent for the land, which structures of the USSR Academy of Sciences occupy. Other cities and villages will, without a doubt, follow the example of Moscow. Where is the academy to get this incredible amount of money? Only from the state and society.

To have a roof over its head and the land, on which the buildings of academic institutions have been constructed, for science is still far from everything. These buildings should be filled with the most advanced instruments and equipment and with communications equipment. But we can only dream about them.

But there is the market already. Cooperative members, at present the only legal subjects of the market, some unions, associations, and so forth, which are not very comprehensible both to society and to science, but mainly the unknown bosses of the shadow market suddenly "saddled" themselves with the burden of the informatization of science and society.

They are exporting raw material, including strategic resources to the West for next to nothing, while they are importing electronics from there and are selling them at tenfold the price. And not last of all to academic institutions.

We need, like we need air, an advanced data processing system and the intensive production of its hardware. We essentially do not have all this. It is necessary to buy data processing hardware abroad, for hard currency. But where is one to get it? This is another problem that the academy is incapable of solving by itself.

In connection with the changeover to a market the problem of the personnel of academic science is very serious and urgent. By the Ukase of the President the wage of academic scientists was increased significantly (by 50-70 percent). The increase of the remuneration of the labor of junior and middle scientific personnel, the "horses," who transport, perhaps, the heaviest cart of science, gives particular pleasure. But far from all the problems of young personnel of science have yet been solved. On the threshold of the market the "brain drain," and first of all that of young brains, has intensified.

Discontent with their material status, the lack of the most slightly tolerable, by present world standards, conditions for work (there are no space, advanced instruments and equipment, information, and so on), and by the lack of prospects and hope for the future, junior scientific associates, and not only they, but also eminent professors and individual academicians are going to the West and first of all to the United States.

In itself this fact is positive, provided they go for a specific period (for practical studies, for training, under contract, and so on). Science is a phenomenon common to all mankind, the exchange of ideas and people is an indispensable condition of its successful development. Especially as they let our scientists work at first-class laboratories and institutes, which are furnished with the

most advanced instruments and equipment. There they acquire invaluable experience.

However, it is impossible not to say two "buts."

The first: Many scientists are leaving forever, and this is regrettable. Moreover, it is not ruled out that after the passage of the law on the freedom of departure from the country and entry into it the "brain drain" will assume a massive nature. Society, which has been deprived of science, and first of all basic science (here for the present the positions of our country are still quite strong), is doomed to a vegetable life.

The second: Far fewer minds are coming to "us," especially for permanent work, than our minds are going to "them." What, in our country is there nothing to learn and no one from whom to learn? Yes there are! But normal, not to mention good, working and living conditions do not exist.

And another danger for academic science, which is connected with the market, is the departure of scientists, once again primarily young scientists, for cooperatives, for joint ventures, and for the forming market infrastructure—joint-stock companies, various kinds of associations, banks, exchanges, and so on.

Among those who left and are leaving there is "ballast," those people, for whom there is no place at academic institutions. There are also fanciers of the "easy" ruble.

Academic science, particularly social science, is growing old. The average age of academicians of the Philosophy and Law Department is over 70, while that of corresponding members is over 60. The department sincerely wishes to rejuvenate and to be reinforced with young scientists of the new formation, with those who work in the most advanced directions. But its possibilities are limited. At the regular election (December 1990) they gave us only three vacancies for corresponding members. And this is for five main directions of science: philosophy, state and law, sociology, psychology, and the history of natural science and technology.

Let us return to the market. Many institutes are surrounding themselves with various kinds of commercial organizations—cooperatives, associations, small enterprises, and so forth. They earn money. It would be foolish to deny their necessity and utility.

But will not academic science be split up under the onslaught of the market, the ruble, and the profit into these small organizations, which work for their own benefit and the main goal of which is to obtain an immediate gain and to leave for later everything else, that is, that with which academic science by its nature is called upon to deal? Here is where the danger is.

But symptoms of this exist. The cases, when scientific personnel and even executives of scientific institutions sit in two chairs—an academic chair and a cooperative chair—are already frequent. Here they give preference to the cooperative chair, pass off the results of work at a

scientific institution as the work of the cooperative, and sell these results on the side, not excepting the West.

It is necessary to establish strict order in our academic house and to tighten up financial control.

The market, undoubtedly, will result in the serious organizational reform of academic science. Some institutions, apparently, will be closed as superfluous, new ones will be established. The serious reduction of scientific personnel and the formation of a market of manpower in science are not ruled out. It is now already necessary to prepare for this. It would be a good idea to conduct an "inventory" of the personnel of science and to determine who is doing what and who is capable of what. Perhaps, one should advise some people to find a different job, others to retrain themselves and to master the most advanced themes, others to leave for deserved rest, and so on.

I understand that this matter is a delicate, tricky one, for it is a question of the fates of people. But whether we want to or not, we will have to do this job, and it is necessary to begin it already now. It would be a good idea not to put off the implementation of the system of contracts of scientists with scientific institutions.

What was said above does not mean that academic science and the market are absolutely incompatible. And it is a matter here first of all of the fact that there is no pure academic science, inasmuch as academic research either is acquiring itself the nature of applied development or is a synthesis of both or, finally, in the shortest time may be transformed into development.

In other words, a significant share of academic research can be used in production and other spheres of social life.

Meanwhile, only half of the academic developments are used in practice. The remainder are unclaimed, inasmuch as the marketless economy is not interested in their practical application. The "half-life" (aging) period of knowledge now comes to four-five years, while this means that the efforts of many scientists and scientific collectives are being expended in vain.

It seems that the market will claim scientific knowledge, and particularly applied developments. And it will be possible to sell this knowledge abroad. The market will require some demonopolization of science and the lending of flexibility and mobility to its institutions. Apparently, goal program subdivisions will be formed far more intensively than now. If there is a goal, scientists and specialists, who are capable of working for the benefit of this goal (under an agreement, contract, or another arrangement), gather under "one roof" for some time. If the goal is achieved, the subdivision is dissolved. If a new goal is posed, a new organization is established.

No, this does not deny at all the necessity of the existence of stable academic institutes. For there are permanent

problems and goals, there are scientific schools and directions. There is also, finally, continuity in science.

At the same time stability is not absolute. Modern science, be it superacademic, is dynamic, it relentlessly moves into the depths and in breadth. Newer and newer trunks, branches, and leaves grow on its powerful roots. Not to allow the winds to bend and the leaves to wilt and fall is an indispensable task of the management of science.

I would not like to end my notes on a pessimistic note. Once a week I attend the meetings of the Presidium of the USSR Academy of Sciences. And I cannot but admire the fortitude and tenacity of the gray-haired academicians, who have been commended with the regalia of a world rank, and the relatively young, but also famous academicians. Their disinterested aspiration to preserve the academy in spite of all the destructive pulls. To preserve the academy and science for the homeland. Without science, I repeated, our still great power cannot be great and authoritative.

Biologist Claims Soviet Research Establishment Superior to U.S.

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[Article by Doctor of Biological Sciences Leonid Margolis: "Is the Pauper Always Free? On the Shortcomings of American Science (In Spite of Which It Is Developing Successfully) and on the Advantages of Soviet Science (Which Are Not Being Used)"—first paragraph is NEDELYA introduction]

[Text] Everything Becomes Known in a Comparison

In our times, when owing to the freedom of speech and the press it has become possible to say what many people, if not the majority, also knew earlier, in many published works it is being convincingly demonstrated how in various fields we have fallen behind the developed countries, first of all the United States. This also applies to basic science. Following, however, scientific tradition, in which not support of the general opinion, but the identification of contradictions and paradoxes is valued, I have attempted in these notes to show what, in my opinion, substantial shortcomings exist in the organization of American science and what merits exist in Soviet science, which it would be a pity to lose, if still we fail to restructure it somewhat in the American fashion (which the author, of course, wishes). In the last two-three years, when foreign scientific missions have no longer been dependent either on the administration position or on the party affiliation of the person being sent and have even not involved minor and major compromises with one's conscience, many friends of mine and I myself have visited leading scientific centers of the West and have even worked there.

The main impression of a Soviet scientist, who is making himself more familiar with American biological science

(and everything said below applies primarily to biology and somewhat to chemistry), is its comparatively low average level. In any case, an incomparably lower level than the one that was visualized from Moscow. The point is that, sitting here, in our laboratories, we read and discussed only the best works. That is, we saw only the tops of the distant scientific range—the proud snow-covered peaks. As happens in the mountains, when you come closer, you discover that these tops stand among lower mountains, hills, and even swamps. And if you take the average American specialist, say, in cell biology, I have the impression that he is inferior to his Moscow, Leningrad, Kiev, or Vladivostok colleague both in the reserve of ideas and in the breadth of views.

What is enabling this generally mediocre mass of scientific personnel to create the best science in the world, to work successfully and even very successfully in it, and to advance quite deservedly up the steps of a scientific career? (And this is in a country, where neither membership in the ruling party nor even active participation in voluntary work on Saturdays and Sundays can aid promotion.) In order to answer this question, let us recall briefly how basic science is organized in the United States.

As they correctly taught us in school, in America (the country of the golden calf and the yellow devil) everything is for sale and everything is bought. In other words, it is not necessary to extort assets and limits: If there is money, it is possible to buy everything necessary for work. Therefore, in reality all that is required of organizers of science is to divide the money that the state allocates (and the basic sciences are financed almost entirely precisely by the state). They divide it in the form of subsidies and grants. They divide it simply and, according to their concepts, fairly: They give much to the best people, a little less to good people, and do not give anything at all to bad people.

Good-bad is not a description of a person in general and even not of his scientific services in the past, but merely a quality of his present research and plans for the immediate future. Past services in America mean hardly anything. I met venerable scientists, who were still full of energy and had been forced to halt experimental work because they did not win this annual competition for grants. The American system does not pity old men at all, but is aimed at the support of young people. There you will rarely encounter in a laboratory a person over 60-65. Our system, on the contrary, is aimed against young people, who at 35 may be registered as junior scientific associates, while directors remain for decades.... All extremes are bad! In the laboratory, as in any society, "old men" are necessary. Who else can pass on traditions and skills? Understanding this, the Americans are attempting to introduce various nominal grants for elderly distinguished people. But benefits and privileges poorly take root in our country....

At present, in the firm conviction of all American scientists, a deep crisis reigns in their science (God grant

that we live to see such a thing!). Last year a little more than 12 percent of the submitted applications cleared the hurdle of state financing. Another small portion of basic research is financed by private foundations. And although the fate of the remainder does not evoke envy, our favorite idea of giving something to everyone, but a little less, does not occur to anyone. For some reason it is clear to them: It is necessary either to finance a job in full and to demand a result or not to waste money at all. (In America one prominent science administrator shared with me the following piece of wisdom: "If you have 10 candidates and divide the money among them equally, you will have 10 enemies. If you give everything to five, you will have only five enemies, but in turn will have five friends!")

Who evaluates the quality of submitted applications? Temporary committees of scientific experts do this. The system is very democratic, therefore, it is very difficult to copy it in our country. After all, owing to the financing of individual projects, and not institutes, scientists in the United States are very independent of the authorities, and, besides, the committees replaced every year. (In our country venerable scientists, of whom there are not many, would sit on such a committee, that is why our temporary committees are the most permanent ones.)

The reader has the right to ask: Do the promised shortcomings exist in such a fine system of the organization of science, which the present generation of Soviet scientists dreams of living to see? As always, the shortcomings prove to be a continuation of the merits.

The point is that the above-described system, which is ideal for the mass production of scientific results, is akin to any mass production. For example, the production of video cameras or computers, when the latest invention is put on the market for the first time as an extremely expensive novelty, but soon, having been copied in millions of items, rapidly decreases in price and becomes affordable to the ordinary buyer. Science in the United States is organized in such a way that even a comparatively modest scientific discovery immediately attracts in the fight for grants tens of researchers from various laboratories. (Any committee of experts is more inclined to subsidize rapidly advancing directions "on the cutting edge of science," as our journalists write.) A situation of a concentrated offensive, when vast scientific forces rush into a small breach, forms. (Incidentally, this makes the attempts of our laboratories to join in the race for results in new directions practically hopeless. While you are gathering the necessary reagents, months, if not years will pass.) However, the system, which is fine for "mass" research, encourages the conformity of thinking, particularly of young people, like, incidentally, the complete keeping up with fashion in ordinary life.

America is a country of technology, a country of machines. And science in America is the science of machines, the science of instruments. In the laboratory, as in ordinary life, it is prestigious to have an instrument

of the latest make, if only to demonstrate one's prosperity. However, the vogue for instruments is playing a mean trick on researchers, particularly young researchers. People are ceasing to think first about general problems (such reflections usually do not require instruments), then about specific problems. True, the enormous capabilities of instruments are reducing to naught many procedural difficulties, which we have been trying here to overcome for years. It is becoming possible even for a novice to test a new idea. In our country implementation is valued more, everyone has many ideas. There, under the conditions of the universal feasibility of even complicated experiments, ideas are acquiring decisive importance. No one shares with each other pure ideas, even minor ones, unless the work is being performed jointly. Hardly anyone will give you an article which has not yet been accepted for publication. This, of course, does not do science good.

If these notes had been written several years ago, the following critical situation would have demonstrated once more the well-known thesis that there it is a dog-eat-dog world. In order to obtain a grant, it is necessary to be an actively working researcher, to participate in conferences and symposiums, and, what is the main thing, to publish and publish scientific articles in good scientific journals. But creative slumps and crises occur in life. Imagine that you became sick or are divorcing your wife. Then later, when with redoubled zeal, having yearned for your favorite work.... No! In the American system there will most likely be no "later." Without recent publications you will not win a grant and, hence, will not return to the work. Is such rigidity of the American system bad or good? Of course, it is good, since it does not allow the mass of loafers to obtain money for nothing. But it is not at all good, if it is a question of the independent scientist, who unsuccessfully dedicated himself for years to the solution of a very difficult, but important problem.

In general, if I had to name a single merit of Soviet science, I would choose freedom. In spite of the abundance of approved long-range plans, the country and the large number of supervising Academies of Sciences committees, the researcher in our country (unlike him, at any rate) can devote himself to just his science. The sources of this freedom, of course, lie in the Soviet organization. But it is also necessary to try to preserve this freedom after our science has been reformed.

Our freedom affords in principle a great opportunity, it evokes envy among our foreign colleagues. Only, incidentally, are not familiar with the true situation (the pauper's choice of a profession, the impossibility to switch one's specialty, the impossibility to pose a new problem, if a person has already spent a year on it, to spend a year in the library, thinking over new problems. The departmental barriers, the scientific wars, which are cursed by everyone, exist only on the surface. In turn below nothing is possible, no one is interested in tomorrow joint experiments with colleagues from any

department. (Freedom!) While the preapproved plans are so general that it is possible to fit any results to them.

A consequence of this entire quite disorderly destitute system is openness for any contacts. But how under the conditions of the still existing isolation of our science are you to find those, who have the necessary equipment and who can give valuable advice or criticize? And there is no need to fear that they will steal your idea. Even if currency is available, you need to order the necessary reagents a year ahead. (In general any firm actually supplies them in three-five days, one can only guess where our orders are shelved the rest of the time.) It is necessary to extort equipment separately. There can be no question of any kind of stealing of ideas! God grant that we implement our own.

When they criticize our science, first of all they charge that the system enables a large number of loafers to exist. In my opinion, the problem of our science is not at all that there are many loafers, but that the conditions for the work of practical people do not exist. And freedom is all the same small compensation for everything else. Freedom and openness for scientific contacts make our scientists people of broad views, who are receptive to the ideas of others. (Indirect confirmation of this has appeared—our young people are in demand on the world market of scientific manpower.)

The problem of the "brain drain" now worries many of our science administrators, who lived at the expense of the work of their young colleagues. For some reason the question of what to do with the brains that did not drain away causes less anxiety. Will a worthy application and a worthy reward be found for them in our country?

In what direction do we need to restructure science? First of all, in my opinion, it is necessary to abandon the idea of being in front of everyone in all fields of science. This is not happening anyhow. It is possible to cite the following parallel: It is clear to everyone that in the foreseeable future we will not organize the production of motor vehicles that are better than Japanese motor vehicles. But, on the other hand, no one can duplicate our Palekh boxes or items made of walrus bone (and they often cost more than motor vehicles). We cannot compete in those fields of basic science, where much depends on high-power equipment and new instruments.

But, contrary to widespread opinion, science is still not assembly-line production, but, as before, single-item production. And here we have the opportunity for new ideas and the opening of new directions. And with this capital, if they do not cut off "the new thinking," they will admit us to the world scientific system.

The main shortcoming of our science is poverty. We cannot afford our immense science! It is pointless and immoral to maintain hundreds of laboratories without getting foreign exchange assets for the purchase of equipment, reagents and instruments. It is immoral both with respect to scientists and with respect to the people, who consider them parasites. Is it not worthwhile simply

to calculate how many rubles and how much currency are required for one normally equipped biological laboratory and to divide by this number the budget that is being allocated for the development of all this science? Suppose it turns out that we can maintain on state money eight or five cell biology laboratories. So be it! But these will be laboratories, in which it is possible to work. We will announce a competition at them.

Indeed, what is to be done with the independent jury? But it is possible to turn, for example, to the U.S. National Institutes of Health. They do not consider it humiliating for themselves to appeal to foreign experts, at times also Soviet experts. Why should we display arrogance?

Reform in science is no less necessary than in the army. But in the sweet burst of destruction of the old system one should bear in mind: We will not succeed in copying even the best American system. We do not have and will not have that much money. The hard life had the result that personal relations in our country outweigh scientific objectivity, while the status in science is being transformed into the most prosaic everyday benefits and privileges, which it is oh so difficult to forgo. But inasmuch as the initial conditions are different, the result will inevitably also be different.... And, of course, one should save that, be it even a little, which in the organization of our science is better than what they have. Because it is possible instead of an artel of Arkhangelsk bone cutters and Palekh craftsmen to open a motor vehicle works and to stamp third-rate motor vehicles. But is it worth it?

Although, on the other hand, you will not get far without a motor vehicle!

Privileges, Personal Benefits of USSR AS Presidium Members Revealed

91740098A Moscow ARGUMENTY I FAKTY
in Russian No 10, Mar 91 p 5

[Article by Corresponding Member of the USSR Academy of Sciences V. Smirnov, winner of the Lenin Prize and the USSR State Prize, under the rubric "In the Light of Glasnost": "'Sour Cream Is Only for the Members of the Presidium'"—first paragraph is ARGUMENTY I FAKTY introduction]

[Text] Today it has become an ordinary thing to hear and read statements that expose the privileges of generals and marshals, the nomenclature of the CPSU Central Committee and the USSR Government, and so on. However, in the midst of the general confusion in our country there also exist to this day islands of stagnation, where the age-old traditions have not been broken. Such an "oasis of calm" is the system of the USSR Academy of Sciences.

An important sphere of activity of its presidium and administration of affairs is concern for the life of its members, their daily life, health, and relaxation. Hardly

anyone suspects that the USSR Academy of Sciences, more than any other department, is adhering here to "class" positions.

For many years a dining room, where members of the academy and personnel of the presidium can dine and once a week can receive a food order, has been operating at the USSR Academy of Sciences. In precisely this institution everyone finds out for this first time his own "place under the sun." With an accuracy of a ruble and a can of coffee the personnel of the academy are arranged along the hierarchical ladder: At the bottom are the widows of academicians (an order for 5 rubles [R]), at the top are the members of the presidium of the USSR Academy of Sciences (from R50 up). Inasmuch as the distribution of orders takes place in one room, incidents are frequent. To the question: "Is it possible to buy some sour cream?" the woman monitoring the distribution replies arrogantly: "Sour cream is only for members of the presidium."

The "class" approach at the USSR Academy of Sciences reaches its apotheosis in questions of everyday life in the concern for the health of the members of the academy. Owing to the peculiarities of the contingent (mainly middle age) this question is not an idle one for the USSR Academy of Sciences. The presidium is settling it simply and elegantly: It continues to be treated in the former Fourth Main Administration and uses the sanatoriums and vacation homes of the same administration, the USSR Academy of Sciences has its own hospitals and polyclinics, where the "class principle" is also strictly observed, and drugs are distributed strictly in accordance with the list.

This Sweet Word "Freedom"

Although the USSR Academy of Sciences is an organization, which is carried on the state budget, and exists by means of assets of taxpayers, during the entire history of Soviet power the academy dreamed of complete autonomous and independence, correctly believing that liberation from humiliating and petty control on the part of directive organs would create the necessary climate for more fruitful scientific activity. And the impossible happened! By a special ukase of the president of the country the academy was granted this year the right of exclusive ownership with respect to all the institutions of the system and the opportunity to make independently decisions on all questions of its life.

What decision, do you think, the presidium of the academy made almost immediately after the appearance of the ukase of the President? The same one that the collective of any state enterprise, which has been granted economic independence, makes: to increase the wage! But, in contrast to the state enterprise, which does this at the expense of the profit, the academy carried this out at the expense of the state budget, inasmuch as it does not have other financial sources. The poor secretaries of the rayon committees of the CPSU, who increased their own wage and got into the pages of both left-wing and

right-wing publications. We did this **ourselves**, no Ministry of Finance and Council of Ministers can now order us about. If there are not enough assets for 1991, we will get a new decision on the increase of the financing of science. And you will not, after all, argue: The remuneration of the labor of scientists, as, incidentally, any labor, in our country is wretched, and we are increasing the wage in order to avoid a brain drain abroad. I will cite the new figures on the wage—without regard for the payment for a title—for the managerial staff of the academy (incidentally, they will hardly go abroad!).

The president of the USSR Academy of Sciences—
R2,000.

A vice president—R1,700.

Members of the presidium—R1,300.

Not the absolute figures of the salary, but their strict conformity to the bureaucratic state ladder, to "the table of ranks" evokes surprise. For information I will add that the director of INSERM (a network of biomedical research laboratories in France) receives a wage that does not exceed the wage of a professor in the same INSERM.

"Who Is the Head of the House?" The Apparatus!

In 1987 the government decree "On Steps on the Improvement of the Conditions of the Work, the Medical Service, Everyday Life, and Relaxation of Members of the USSR Academy of Sciences" was adopted through the efforts of the presidium of the USSR Academy of Sciences and the president of the USSR Academy of Sciences personally. In accordance with this decree the USSR Academy of Sciences was permitted to build in Moscow Oblast on parcels of land, which had been set aside earlier, 60 individual dachas for members of the USSR Academy of Sciences at their personal expense.

For three years the presidium of the USSR Academy of Sciences and the president personally have not abandoned the attempts to settle on dacha parcels, which were set aside for scientists, members of the staff of the presidium: D. Piskunov, deputy chief scientific secretary; A. Romanov, adviser to the president; V. Titov, assistant to the president for capital construction; V. Volkov, administrator of affairs of the USSR Academy of Sciences; A. Smirnov, chief of the main administration of material and technical supply; A. Konoshenko, chief of the planning and finance administration of the presidium of the USSR Academy of Sciences.

To what tricks the administration of affairs of the USSR Academy of Sciences is resorting for the firm establishment of this faulty practice! Having rummaged about in the archives, it even found a copy of a decree of the USSR Council of Ministers of 1947, which was signed by Stalin and which destroys any shoots of democracy in the academic environment.

The decision on the construction by the Central Construction Administration of the USSR Academy of Sciences at the expense of the assets of the state budget, which had been allocated for housing construction of the USSR Academy of Sciences, of six departmental detached dachas of the highest class, the cost of each of which exceeded R50,000, was the "crowning point of the academic activity" of the president of the USSR Academy of Sciences.

The "Elite" of Society

No "Kremlin mountain dweller" dictates any longer to the academy how it is to live. The trivialities of everyday academic life, which are mentioned above, show to what a degree of antidemocracy the academy has sunk. This antidemocracy is permeating its entire life in what is large and what is small. The humiliating 5-ruble holiday tip to the widow of an academician and the reluctance of the president of the USSR Academy of Sciences to leave the building of the presidium for a meeting of associates of the academy are things of the same order. Having shut itself off from society by a Great Wall of rules entitled "The Charter of the USSR Academy of Sciences" and not wanting to give up the life annuity in the form of payment for a title, the academy is losing more and more rapidly the aura of a nongovernmental organization, which unites the scientific elite of society, and resembles more and more an interest club.

Established originally in the image and likeness of western informal associations, during Soviet times the academy was transformed into a structure which simplified for the authorities the monitoring of scientists. As in other professional unions, the apparatus of the academy gradually began to live an independent life with its own concerns and tasks, among which assistance to scientists is a small matter. I do not think that this organization in its existing form can be useful in the management of one of the most delicate spheres of human activity—the creativity of the scientist. Perestroika gave us a chance. We did not make use of it.

Editorial note: It will be interesting, we believe, for readers to learn what the administration of affairs of the USSR Academy of Sciences, the president of the USSR Academy of Sciences, and scientists think in this regard.

Law on State S&T Policy Makes Little Progress

917A01294 Moscow POISK in Russian No 8 (94),
15-21 Feb 91 pp 1, 3

[Article under the rubric "What Is Science To Be Like?": "Such Long-Awaited Laws Collected Dust in the Council of Ministers for Five Years. Will the Situation Change Today?"]

[Text] "Talent requires protection," we asserted in one of the first published works of POISK under the rubric "What Is Science To Be Like?" State protection in the form of legal acts which enable a person, who has

devoted himself to science, to compare his creative interests with the science and technology policy being pursued in the country.

From this standpoint the law on state science and technology policy is the main one in the package of legislative acts, which has been proposed for discussion. While considering it on one of the February Saturdays at a meeting of the Commission of the CPSU Central Committee for Science, Education, and Culture, Academician Ivan Frolov, a member of the Politburo of the CPSU Central Committee, observed: "The goal of this legislative initiative, with which the CPSU intends to come forth, is to raise and change completely the status of science and scientific activity in our society."

The commission worked with an expanded membership, there were many statements, but Academician Nikolay Laverov gave the main report. He reminded those who had gathered that all the developed capitalist countries during periods of radical reorganizations of the economy relied on an active state science and technology policy. Now in the United States about 100 laws of such a type are also in effect. They are particularly needed for the protection of the creative element in society when changing over to the market economy. In our country the opinion that competition will automatically ensure scientific and technical progress and it will be possible to do without goal-oriented legislative activity, is now widespread. Alas, it is not so.

"Today we urgently need the law on state science and technology policy. Its draft was published and was widely discussed, now it is under the consideration of commissions and committees of the USSR Supreme Soviet," the speaker reported. "However, the matter is proceeding slowly, and, apparently, it will not be offered for discussion at the next session. Thus, the passage of the law will be postponed at least until the next session of the parliament."

But the law is urgent. In its draft the role of the state in the support of basic research is formulated and the democratic principles in management and self-management and in the delimitation of the competence of the USSR and the republics in the scientific and technical sphere are specified. In its social significance this law, on which, incidentally, agreement has already been gotten with all the republics, could play the role of a kind of constitution of the scientific and technical development of the country.

The law on scientific intellectual property and its protection is also of no less importance. Throughout the world the legal protection of the intellect is the basis for the formation of market relations, and without it we will experience quite soon the erosion of the scientific potential of the country. It will be actively exploited by those who did not participate in the obtaining of knowledge. The draft of this law was submitted to the government

and has now been sent for the drawing of conclusions to the republics and a number of ministries and departments.

It is clear that for the increase of the efficiency of the work of scientists it is necessary to have a modern organizational form of their unification. The USSR law on the scientific organization, Academician N. Laverov related, is devoted to this problem. It is called upon to ensure the legal regulation of the social relations that appear when establishing a scientific organization.

And the final, fourth law in the package of documents is the law on the status of the science worker. "I would like to emphasize," the speaker noted, "that its draft was drawn up on the basis of the statute on the status of the science worker, which was approved by the United Nations. This is important because for the present in our country scientists are regarded as civil servants, but these all the same are completely different categories. The law on the status of the science worker postulates the freedom of creativity, guarantees the rewarding of the worker and the use of the results of his labor in the interests of society, and specifies the rights, duties, and responsibility of scientists."

The discussion of the offered materials began immediately.

Vice President of the USSR Academy of Sciences Academician Vladimir Kudryavtsev was one of the first to speak.

"We have in our hands," he said, "four drafts of laws on science. But they were drawn up five years ago! For five years they lay about in the USSR Council of Ministers, until Nikolay Laverov claimed them. Is this not evidence of the fact that in society a nihilistic attitude toward science prevails? Moreover, not in society as a whole, but in specific strata, which hold top-level positions.

"Everyone is talking about the fact that perestroika is spinning its wheels and is not yielding a return. But the old practice of making state decisions without reliance on science is continuing. For example, over the past year economists of the USSR Academy of Sciences drafted a large number of scenarios of the development of the scientific and technical potential of the country and the organization of commodity exchanges and studied the problem of a cost accounting market, lawyers prepared and sent to directive organs drafts of laws in the area of civil, constitutional, and trial law.... But where are they? State structures do not even examine the drafts of decisions and forecasts, which are proposed to them, and are not directing attention to the warnings both in the area of the economy and in the area of ethnic relations.

[Boxed item: State financial support of scientific and technical progress is accomplished by means of budget financing and the establishment of privileges when taxing the profit of enterprises, associations, and organizations. (From the law)]

"Thus, if we want to get ourselves out of the formed situation, it is necessary to organize feedback between science and state organs. This is the first thing. And the second is that it is necessary to work for the consolidation of the efforts of all scientific personnel of the country in getting to know the laws of nature of society. After all, regardless of ethnic or territorial affiliation all scientists share the common human values of the intellectual world.

"In this connection in our draft of the decree I would propose to add the following phrase: 'To promote the preservation and strengthening of the unity of basic science in the interests of its further development in all the republics and regions of the country.' This, perhaps, will keep several academic institutions and higher educational institutions from being split into small national subdivisions."

Responding precisely to the appeal to the national republics, President of the Kazakh SSR Academy of Sciences Umirzak Sultangazin reminded those who had gathered of the experience of the work of the Supreme Soviets. A large number of laws, he said, have been passed, but which ones are working?

"If we want the laws on science, which are being discussed, to be effective, it is necessary to study them carefully," he declared. "But it is possible to take what we have today—these drafts—as nothing more than a basis. They are declarative and are more like concepts than legislative standards. Most of all," the speaker analyzed, "this applies to the first draft 'On Science and Technology Policy.' Nothing but general phrases are there. For example: 'the state stimulates competition, alternative projects, and enterprise....' But how? The mechanism of stimulation is not indicated. The second misfortune of the documents is the repetition of previous laws. For example, more than 50 percent of the act on scientific organizations is analogous to the Law on USSR State Enterprises, against which society, as you remember, has many claims.

"The third shortcoming is verbosity, it is worthwhile to shorten the document significantly. And if only to take into account that in all the republics declarations of the sovereignty of the republics have been adopted, but in these drafts of the laws they also seem not to have heard about such realities of our life. Even the old names have been preserved—everywhere it is the Council of Ministers instead of the Cabinet of Ministers."

But then President of the Ukrainian SSR Academy of Sciences Academician Boris Paton believes that the draft laws being considered even in such a form create a legal basis for the development of science. And he completely supports the suggestion to address to the USSR Supreme Soviet on behalf of the Commission of the CPSU Central Committee for Science, Education, and Culture the request to expedite the consideration of these documents.

"Nevertheless, we must not confine ourselves to this," Boris Yevgenyevich continued. "The interests of science and scientific and technical progress in practice have already been completely ignored in several laws, which have been passed or have been prepared for passage. As an example it is possible to cite the Law on Taxation. Emergency, extraordinary steps, first of all of an economic nature, are needed in order to preserve if only the scientific potential of the country, which has already decreased.

"The state of basic science during the present transition period is without any exaggeration catastrophic," the academician asserted. "We in the Ukraine were forced following the USSR Academy of Sciences to increase the wage of scientific associates. But such a step in case of an invariable total amount of allocations is turning into to the self-devouring of science.

"Now about sovereignty. Science is international, it is impossible to manage it either from the center or at the level of republics. It can and should be a matter only of state support and state regulation and of the use of financial levers. Funds for the financing of basic research should exist both at the level of the Union and at the level of the republics. On this level the draft of the USSR law of state science and technology policy needs some modification."

Academician Valeriy Barsukov also continued the criticism of the drafts.

"Two most serious questions of the organization of science, it seems to me, are settled incorrectly in the drafts of the laws," he stated. "First of all I am talking about the land, on which scientific institutions stand. Of course, it should be transferred to the jurisdiction of these scientific institutions without any stipulations, whether or not they are engaged in commercial activity. And the second thing concerns taxes.

"We are terribly afraid all the time that scientific institutions will begin to earn money, especially currency. But what is bad in this? This is wonderful, if, while fulfilling its basic purpose, the scientific research institute will also be able to find the forces and to organize a small enterprise and by means of it will earn currency to buy lacking equipment or to organize the production of necessary instruments. We, for example, at our institute have established two joint ventures, at which we developed excellent instruments for the diagnosis of the most complex diseases—such as Acquired Immune Deficiency Syndrome (AIDS) and hepatitis. And it is possible to begin producing this equipment. Is it really necessary to object to such activity? Why does the state intend to fleece the most active and enterprising people with taxes, disspelling in them any desire to be such?

"So that it is necessary to remove, I believe, the stipulations about the undesirability of commercial activity in academic structures and to record that if such structures exist and are yielding output, they, on the contrary, should be exempt from all taxes. Including taxes on

currency receipts. Only in this way will we obtain the result that society needs. And I also believe that all the profit, which is used for retooling, should not be taxed. Such is the procedure in civilized countries, and it is yielding good fruits."

[Boxed item: The state guarantees a stably increasing amount of allocations for the indicated purposes and establishes the lower limit of expenditures on the development of basic research as a specific percent of the volume of national income (the gross national product). (From the law)]

Aleksandr Popovich, chief of the Humanities Department of the Ukrainian SSR Communist Party Central Committee, directed attention to the fact that in the law on the status of the science worker the right to additional living space for some reason was omitted.

"Naturally, in the countries, to whose documents we directed attention," he said, "this problem does not exist. But in our country it does exist, and what an urgent one it still is! And while citing from habit Lenin's decree on the 'spare' room for the scientific associate, we are nevertheless not capable of freeing it up."

The proposed abandonment of the system of scientific titles and degrees, Aleksandr Popovich continued, also does not arouse enthusiasm. Is this not an absurd concession to the trend of universal leveling? I am afraid that it will be of questionable service to the cause of restoring the prestige of science in society.

[Boxed item: The state guarantees scientific personnel and their collectives protection against bureaucratic pressure on them and incompetent interference in the research process, as well as the timely publication of research results in the country and abroad. (From the law)]

Corresponding Member of the USSR Academy of Sciences Nikolay Karlov, rector of the Moscow Physical Technical Institute, also made his contribution to the critical evaluation of the proposed drafts of the laws:

"The laws on science are needed, but in their present form they are still too raw. In the documents there are many internal contradictions. The material and moral aspects of the matter do not link up. Especially when the question concerns the protection of copyrights, individual scientific property, and the contract system. For example, the undergraduate or graduate student, who works in a scientific collective and is not a member of it, is often the author of some innovation. How in this case is one to settle the question of intellectual property? And what about the personnel accompaniment of science and technology policy, and with a lead? It was not established in the documents at all, and this will obviously destroy the foundation of our future building of science.

"But these, too, are still not all the deficiencies. In the competitive system of the appointment of docents, professors, heads of departments, and senior scientific associates we are already now coming into conflict with the latest laws on trade unions and with the well-known ukases of the Constitutional Oversight Committee on the rights of workers. This aspect of the matter, which is connected with labor legislation, should also be worked out more precisely and clearly.

"And what about the law on the scientific organization? It errs in the direction of populism—too much importance is attached there to the rights of the labor collective and the council of labor collectives. In the scientific and educational collective the basic role and the final decisive say should all the same be reserved for scientists or professors and instructors."

The conference was already drawing to a close, when the note from Aleksandr Tatarkin, acting director of the Institute of Economics of the Ural Department of the USSR Academy of Sciences in Sverdlovsk, with the request to allow him to speak was found. And it is a good thing that it was found—Aleksandr Ivanovich came to the meeting of the commission with the conviction that today the party should itself rely to a greater degree on science and scientific research.

"Under the conditions of the sharp increase of the number of parties in our country and political trends," A. Tatarkin said, "only that party can aspire to the role of the ruling party, which will rely entirely and extensively on science and scientific research. Therefore, the initiative of the Commission for Science, Education, and Culture on the preparation and discussion of draft laws on science is timely. This question is not only already ripe, but also overripe. But I would propose to submit for consideration by the USSR Supreme Soviet not a series of draft laws, but a draft of the Fundamentals of Legislation of the USSR and the Union Republics on Scientific Activity, in which all these drafts would be included as sections.

"Here, it seems to me, it is better to observe the old rule of lawmaking in the USSR: The Union passes the Fundamentals, while the union republics pass laws. The abandonment of these traditions, I think, will be taken not in the best way. While having proposed the Fundamentals, we could avoid the confrontation, the war of laws, which today accompanies our entire life. Then, having given the union republics the opportunity to pass a law with allowance made for their own peculiarities and their own traditions in the development of science, we would have more chances to pass something that will be implemented.

"And a final thing. It is worthwhile for us, I think, to ask the USSR Academy of Sciences, the USSR State Committee for Science and Technology, and the State Committee for Public Education to prepare proposals on the establishment of a unified fund for the promotion of the development of scientific research. Either within the

framework of this general basic research fund or independently. You see, our institute, for example, serves two autonomous republics—Udmurtiya and Buryatiya—and five oblasts—Chelyabinsk, Sverdlovsk, Kurgan, Perm, and Orenburg Oblasts. In each here region we have established departments of our institute. But at all of them together we have only three personal computers.

"Well, about what serious economic assistance to the regions is it possible to speak? It is impossible to conduct research with the attainment of a result without computer equipment and without information networks. It is simply naive to engage in this."

The envoy of Novosibirsk—Gennadiy Shvetsov, chairman of the council of secretaries of party organizations of the Novosibirsk Scientific Center of the Siberian Department of the USSR Academy of Sciences—also stated that the submitted drafts of the laws are still very incomplete. Especially concerning intellectual property. Apparently, it is necessary to seek more carefully the optimum correlation of the interests of the state, the enterprise, and the scientific associate.

But the laws on the status of the scientific associate and on the scientific organization in general look artificial. At any rate, the former is regarded, Shvetsov noted, as a cross between the code of the builder of communism and the charter of the institute.

What is to be done? Both these and similar legislative acts should be run through conferences of scientific associates. This will also be very useful from the standpoint of the consolidation of the party organizations of institutes and, of course, will be useful for the cause, because the laws will receive the support of the scientific community.

Well, the science department of the newspaper POISK completely agrees with the last suggestion and is prepared to take part in this discussion first of all through the voices of our readers.

[Boxed item: The peculiarities of the application of this law in defense sectors of industry and to individual enterprises, associations, and organizations are specified by the USSR Council of Ministers. (From the law)]

President of USSR Academy of Medical Sciences Interviewed

917A0124A Moscow POISK in Russian No 7 (93),
8-14 Feb 91 pp 4-5

[Interview with President of the USSR Academy of Medical Sciences Valentin Ivanovich Pokrovskiy, by POISK correspondents Dmitriy Mysyakov and Boris Nuvakhov, under the rubric "The Club of Presidents"; date and place not given: "There Is Hope for a Cure"—first two paragraphs are POISK introduction]

[Text] Today POISK is commencing on its pages the new rubric "The Club of Presidents," which from the very

start is fated to bear the stamp of particular elementariness. Only those people, who have been given the opportunity to experience all the sweetness and all the weight of presidential power, can be members of our symbolic club. But this does not mean that the doors of the club are closed for all others. The idea is precisely that every reader of ours would be able to ask any of the presidents his own questions and to receive exhaustive answers to them. While journalists of POISK will assume the role of a connecting link and will try to see to it that the dialog would be, as is now customary to say, "frank and constructive."

The honorable right to open the newborn club is granted to the president of the USSR Academy of Medical Sciences.

[POISK] Valentin Ivanovich, congratulations. You are the first full member of our symbolic club. And this, believe us, is not by chance. For, judging from the editorial mail, medical science like no other worries the minds and hearts of our readers. True, notes of alarm and criticism are being heard more and more often in the letters. It is not too pleasant to talk about this, but there is an obvious crisis of confidence in so-called official medicine, but at the same time also in domestic medical science.

[Pokrovskiy] You are right, unfortunately. I could cite the fact that now practically no one is succeeding in escaping critical arrows. I could say that such, they say, are the times. But this, of course, is no consolation and especially no excuse.

People are not satisfied with our medicine. It is clear why. Many physicians and nurses work poorly because they are poorly trained. There are not enough instruments and equipment. There are almost no drugs at pharmacies. Poverty reigns at polyclinics and hospitals. The situation at scientific medical institutions is also no better. The leadership of the country, pardon the bluntness, is engaged in undisguised demagoguery, when from various rostrums it declares "priority attention to the social sphere." In practice the situation is not improving, but from year to year is becoming more and more serious. The meager increases in the budget allocations for medical science lag hopelessly behind inflation processes. Financing is actually decreasing. This is our most terrible scourge.

[POISK] Pardon us, Valentin Ivanovich, but complaints of poverty are now being heard from all directions and for a long time now have not seemed convincing. Moreover, this year assets will begin to be received from various funds.

[Pokrovskiy] Yes, they promised us 70 million rubles [R] for work on the state program of the combating of the most widespread diseases. We distributed this money a long time ago among the performers, but have not yet received a kopeck. Thus far it is unknown what we are to

expect from the all-union basic research fund. In short, for the present there are just hopes. But they exist, and this itself is good.

[POISK] And still science does not live by the ruble alone, does it?

[Pokrovskiy] No, of course not. But the result of scientific labor can exist in various forms. We have no lack of original, promising ideas. They are using them with pleasure, for example, in the United States. But the Americans themselves trade not in ideas, but in finished products—instruments, methods. Our perennial weakness is technology.

[POISK] Well, here your field of science is by no means an exception. Chemists, physicists...are complaining of the same thing.

[Pokrovskiy] This is natural. The diseases are common ones. We are also all suffering from the "brain drain." Just recently I received a letter from America. A very capable immunochemist is working under contract at one of the scientific centers there. They are suggesting that he extend the contract for another year. Apparently, he will agree. And not because he receives his salary in hard currency (although this is also important), but because here, in the homeland, it is simply impossible to complete the started work. And, you know, I do not blame him. I also do not presume to judge those who leave scientific laboratories for cooperatives. For the difference in income is enormous!

But in recent times a third channel, through which "brains are draining" from our academy, also appeared. After the sharp increase of the wage in the system of the USSR Academy of Sciences our scientific associates, who are engaged in basic research, leaned in unison in the direction of the large Academy. Of course, they continue to work for Soviet science, but the scientific institutions of the Academy of Medical Sciences in this case are being stripped. While the people, who did not ride off anywhere and did not walk off anywhere, are feeling more and more strongly like "second-rate scientists." The course of their thoughts is evident: Since they pay less, hence, they value you less, and this is insulting.

[POISK] And what is the solution?

[Pokrovskiy] I am convinced that scientists of the Academy of Medical Sciences should receive for their work as much as their colleagues at the large Academy receive and should enjoy equal rights with them.

[POISK] It would probably also turn out that way, if your academy was one of the departments of the USSR Academy of Sciences.

[Pokrovskiy] But on no account must one allow this. Suggestions of this sort have already been heard more than once, including just recently. But I and the majority of my colleagues have a different point of view. Medical disciplines in the structure of the large Academy, I

believe, would be in the same sad situation as, for example, culture is today. Namely in the back seat.

[POISK] Does it follow from what has been said that in the interrelations of the two academies not everything is going smoothly?

[Pokrovskiy] In any case, I would not say that the older "sister" is greatly worried about the younger one. Let us recall if only the Ukase of the President of the country on the status of the USSR Academy of Sciences. When they were preparing it, they, apparently, simply forgot about us. All right, it is correctly said: "Charity begins at home." Now we together with executives of the agricultural and pedagogical academies are trying to obtain the same conditions as the USSR Academy of Sciences obtained. We are writing letters and petitions. But it was entirely possible to settle this much earlier, back during the summer.

I regularly receive invitations to meetings of the presidium of the Academy of Sciences. But I have only a consultative voice, and they do not pay much attention to it. At the same time we have formed excellent relations, which are based on common scientific interests and fruitful cooperation, with individual scientists and several institutes of the large Academy. But these are rather fortunate exceptions that appeared not owing to, but in spite of the existing order of things. I remember well how several years ago an attempt was made to combine the efforts of scientists in the work on such a major problem as "The Basic Sciences for Medicine." They announced "a large gathering"—a joint session of the two academies. They assembled, talked some, applauded some, and published a substantial collection of speeches and decrees. A serious major program of joint research was formulated. And what of it? Not one point of it has thus far been fulfilled. Other similar initiatives also have a similar fate: a large number of good intentions, but a result close to nothing. At times it is even possible to hear: Large-scale science is not going in the same direction as sectorial science.

[POISK] The very term "sectorial science" contains something pejorative. Does it not seem that way to you, Valentin Ivanovich?

[Pokrovskiy] It does. Moreover, I am certain that it is altogether unacceptable as a definition of medical science. But many staff members in the Ministry of Health, on the contrary, like to place the emphasis on the word "sectorial." They have, after all, their own logic: The ministry supervises the sector and, thus, its science. And, imagine, it is displaying enviable diligence in this. At times the Ministry of Health slips its guiding hand even into the empty pocket of the academy, attempting to use the assets "gained" in this way to plug the holes, of which there are more than enough in domestic health care. Just the opposite also happens, but at times the money is redistributed within the academic system. In the ministry they probably believe that they can see better there.

Incidentally, at the last session of the academy, when our charter was updated, a large number of copies were destroyed when discussing the first paragraph, in which it should be stated what the Academy of Medical Sciences is. Previously it was noted there that the Academy of Medical Sciences operates under the Ministry of Health. We would like to see our academy as an independent, self-managed organization. To this day this first paragraph in the new version of the charter remains blank.

[POISK] Yes, the situation is, let us say frankly, paradoxical. However, our conversation is turning out to be very sad. It is all about difficulties and problems. It is time, perhaps, also to talk about successes. Do you as president of the USSR Academy of Medical Sciences have something to boast about?

[Pokrovskiy] For all the "buts" our scientists are actually succeeding at times in making world-level discoveries. Moreover, in the most diverse fields of medicine. Immunologists, for example, comparatively recently identified previously unknown regulators of immunity in the bone marrow. A very promising preparation, which splendidly stimulates the immune system, has already been developed and tested. Excellent results were obtained in the treatment with it of radiation injuries, hepatitis, and serious surgical diseases. If we talk about oncology, it is necessary to note the comprehensive method of treating such a widespread and dangerous disease as Hodgkin's disease, which was developed by us. Earlier many patients died in a short time. Now 95-97 percent of the patients, who have undergone a course of treatment, are guaranteed a prolongation of life by at least five years.

A technique of the early and exceptionally precise diagnosis of diabetes, which is based on methods of genetic engineering, was developed—is this not a success? Or another example: a unique device for the remote crushing of stones in the kidneys, which makes it possible to eliminate surgical intervention for 50-60 percent of urolithiasis patients. With respect to many parameters the Soviet device surpasses the best world models.

There is also something for microsurgeons to be proud of. Today severed extremities are being successfully replanted at 65 clinics.

Fortunately, it is possible to continue the list of achievements for a long time more. Some of your readers would probably be surprised if I were to say that in several most important directions we retain world leadership. Nevertheless this is so. Soviet scientists can give foreign colleagues impressive odds in many problems of epidemiology, the study of the functions of the brain, the physiology of digestion, cardiology, virology....

[POISK] However, one has occasion to hear more and more often that USSR citizens are going abroad for treatment.

[Pokrovskiy] This is one of the present epidemics. Here, say, particularly many patients, who require a bone

marrow transplant, are going. Meanwhile Moscow specialists perform such operations perfectly well. And they could perform tenfold more, but their potential patients for some reason prefer to obtain assets in currency, which are enormous by our standards, and to spend them on treatment abroad.

[POISK] It is interesting, but are there reverse examples? Are people coming here to be treated?

[Pokrovskiy] They are. Our ophthalmologists, and not just Fedorov, have many foreign patients. Soviet neurosurgeons have an excellent reputation. But here is the paradox: Our patients with the same ailments are rushing to overseas doctors. They trust them more.

[POISK] You see, Valentin Ivanovich, were are returning again to the question of trust. The starlit hour, it seems, has come for healers of all kinds. Psychics are at the height of popularity. People, however strange, trust them.

[Pokrovskiy] It is nothing strange. Bursts of interest in wizardry (I call it plague worship) are characteristic of any troubled times. This was observed, for example, during the years of World War I. If you go through the pages of the press of those years, you will probably be astonished: absolutely the same thing, except that the terminology differs from the present terminology.

There are historical periods, when large groups of people find themselves at a psychological dead end.

The subconscious search for some support, protection begins. Various "magicians," "psychics," and "people from other planets," who promise to cure all diseases and in general to make life easier, also appear here. People believe them because they want to believe someone. The press also incites people to this. Not that long ago television showed an amazingly stupid program, in which some mysterious woman told for a long time and in detail about how her soul leaves her body, hovers somewhere there, associates with humanoids, and then returns.

Meanwhile it is extremely difficult for a serious scientist to make his way through to the television screen. And if he succeeds, it is for just a few minutes. They do not seem to offend me, but a quarter of an hour is the most that one can count on. But this is by the way.

As to so-called psychic phenomena, I absolutely do not believe in them. There are no psychic phenomena. But there is psychotherapy, and no one argues with this. Yes, the most ordinary movements of the hands and primitive charms at times yield an obvious effect, but what do the "unusual abilities" of a doctor have to do with it? Rather, the patient should thank himself—for receptivity, for the ability to "involve" in the fight against a disease the reserves of his own body.

But there are different kinds of psychics. Some are entirely sincere in their delusions, but there are very few such people. The majority are simply crooks. But the fact

that among them at times there turn out to be people, who call themselves scientists and physicians, particularly upsets me.

[POISK] Valentin Ivanovich, the readers will not understand us, if we evade the theme of Acquired Immune Deficiency Syndrome (AIDS). Reports on new miraculous remedies are continually being received. Is it possible to believe them? What is your prognosis—when will "the plague of the 20th century" be defeated?

[Pokrovskiy] Indeed, not a week passes without another "sensational" news item appearing. And here I will again have to reproach the press, which hurries to publicize this news. In one of the newspapers, for example, an article about a certain doctor, in which it was stated that he is treating AIDS, but has been forced to do this on the territory of Austria, because in the USSR he cannot even get a reception with Academician Pokrovskiy, was published. Thus it turned out that without my knowledge they all the same had allowed this healer to treat patients. He gave the patient some "living" water and here demanded the rejection of all other preparations. As a result the mother of an infected child with developing pneumonia opposed antibiotics, and the child soon died. Several similar cases—fortunately, less tragic ones—also occurred. Of course, they halted the "experiment." And some time later I went to Austria on official business. And it turned out that Austrian specialists knew nothing at all about this doctor and his method.

Or another incident. Again a report about a miracle drug, which was obtained in Australia from some exotic plant, appeared in the newspapers. We decided to find out exactly what there is there. It turned out that both the preparation and this plant itself are no more than a myth.

There was very much fuss around a method based on the heating of the blood. I received tens of angry letters with demands for its immediate introduction in practice. But at a congress in San Francisco, where leading scientists of the entire world had gathered, the authors of this method had to feel ashamed. Specialists immediately perceived in them shameless quacks.

So that for the present no reports on miraculous drugs, alas, have been confirmed. And my prognosis in this regard is not very comforting. Most likely, "the plague of the 20th century" will also become "the plague of the 21st century." Even if we succeed in finding a universal means of control, more than another decade will be required for complete victory.

[POISK] But what about a vaccine? Do you not assume that vaccination against AIDS will become at some time just as ordinary a matter as, for example, vaccination against smallpox is today?

[Pokrovskiy] This is unlikely. For in this case a vaccine of a completely new type is needed. Scientific research of an enormous scale is required to discover if only the

approaches to its development. No, I believe that first a drug will be found, and later, perhaps, also a vaccine.

[POISK] But let us return from the future to the present. What is the current situation in the country?

[Pokrovskiy] It is not as bad as might have been expected. According to our estimates, by the end of last year the number of infected people in the USSR should have approached 1,500. There are now actually less than 600 of them. That is, the launched preventive work is already yielding fruits. Thank God, we were not very late in Elista. It was possible to avoid the further spread of AIDS only because reliable epidemiological inspection had already been organized.

You know, they quite often accuse the Pokrovskiy family of monopolism. They hold, they say, all the threads in their hands and do not want to let them go. But in epidemiology nothing will otherwise turn out. They "uncovered" Elista owing to this monopolism, rather, centralism, in case of which all the information collects in one computer. And when this computer issues information on two infected people in such a small town, it is then that the decision on a careful epidemiological inspection, which makes it possible to find the source of the infection and to identify other carriers of the virus, also appears.

Soviet epidemiologists have to their credit two very important discoveries that will be included in the world history of the fight against AIDS. The first is the mechanism of the intrahospital spread of the virus. And the second is the mechanism of infection of the mother from the child. It is important to understand: We detected these phenomena in our country not because others did not have this, but because we were able to organize better than others our epidemiological service.

[POISK] And a last question, Valentin Ivanovich. You direct the academy and perform the duties of a deputy. Is there enough time for science? For relaxation? And in general is it good to be a president?

[Pokrovskiy] However I regret it, I hardly find time for scientific work. I have begun to write much less. The only thing I do regularly is give patients advice. On Sundays I try not to work, although it does not always work out.

Is it good to be a president? I will say the following to you: It is difficult. But the most difficult thing of all is the fact that all the time I have to switch, to jump from one problem to another. This tires me terribly. By evening my head is often spinning. For 20 years I was the director of an institute and knew at it everything down to the smallest detail. Here I am continually faced with questions, in which I am in general a dilettante. I am forced to go into new areas for myself, and this at my age is not that easy. But there is no alternative, the post of president makes it incumbent.

Leskov on Keldysh Anniversary, Growth of Academy Bureaucracy

917A0103A Moscow IZVESTIYA (Union edition)
in Russian 11 Feb 91 p 2

[Article by S. Leskov: "A One-Way Ticket. Controversial Notes With Regard to One Indisputable Anniversary"]

[Text] When they presented Landau with the Nobel Prize and President of the USSR Academy of Sciences Keldysh congratulated him, the newly made laureate replied: "I also congratulate you, but, frankly speaking, do not envy you."

Foreigners, who attended the ceremony, exchanged bewildered glances. It was explained to them: Mstislav Vsevolodovich Keldysh had recently been elected president of the USSR Academy of Sciences. But, I think, even after this the situation did not become clear for the guests. Well what, it would seem, is ambiguous in the fact that a scientist held such an honorable post? And it is quite obvious that there was no need for any of the Soviet scientists to explain the joke to Landau....

I honestly admit that the anniversary prompted me to write these notes. On 10 February Mstislav Vsevolodovich Keldysh would have been 80. Yes, if you consider that he died in 1976, it is not at all old. He always led people of the same age. He graduated from the university at 20. He became an academician at 35, when the majority of scientists are just bracing themselves for their candidate dissertation. And president of the academy at 50, having left this post at 63, when doors of the academic temple for many people are just opening a little. And still the anniversary is just an excuse.

You never pondered over why did Gregor Mendel, Norbert Wiener, and Albert Einstein discover their laws without holding any posts in science, while our domestic unmaskers of these "bourgeois false doctrines" were without exception in high ranks? Or why do we have more academicians and directors than anyone, while the cat wept for the winners of the highest scientific award—the Nobel Prize? (The prize of Landau, one of 30 years ago, was, it seems, the next to last one.) The answer to the two so dissimilar questions is, in essence, the same: The reason is the total bureaucratization of science in the USSR. Our science is organized according to the party nomenclatural principle, the highest elite is shielded from simple scientists by an insurmountable fence of bureaucratic traps, in scientific surroundings respect for rank and monopolism grow like a luxuriant flower—and this system is so invulnerable that the people, who do not agree with it, are perceived by the conformist majority as kamikazes. It is only in fairy tales that scientists live in an ivory tower or out of absent-mindedness fall into a well, in real life science savored the delights of the administrative command system not in the least less than other areas. The fate of science repeats the fate of the country—the mechanisms, which led to the crisis, are the same.

However, in the 1960's, when the administrative command system was alive and well, we had living, developing science. Precisely during those years the mystification of science and Lysenkoism, which fed on the juices of the very system, were given up for lost. In remote regions scientific centers, which are recognized today, appeared and were rapidly built. Finally, precisely during that period the now unthinkable leap into the ranks of the world leaders in the solution of a large number of major problems—in astronautics and atomic power engineering, in the development of the hydrogen bomb and passenger jet aircraft—was made. Even in the transplanting of organs we were first, and the computer was no worse than that of others. This far from complete list gives grounds to regard the era of Keldysh as the heyday of Soviet science. Now there is nothing of the sort, evil tongues are making malicious remarks: We, they say, "have fallen behind forever." Thus, there is something of sorts, which can prevent the bureaucratic system from living parasitically in the scientific sphere.

Scientists with experience remember the meeting of the presidium of the USSR Academy of Sciences, which was held a quarter century ago and at which a heated argument between Keldysh and Artsimovich developed. They argued about where the academy was going: Would it remain the headquarters of science or did the fate of an ordinary ministry await it? Now it is already clear that the apprehensions of Artsimovich were not unfounded. But could Keldysh with his insight and wisdom not have realized the reality of such a prospect? Obviously, he knew the secret of counterbalancing the bureaucratic style. And this secret lay in the very personality of Keldysh, in the approach to the management of science, which was professed by the president. This chancellery practice has an internal contradiction, inasmuch as the method of Keldysh reduced precisely to the denial of "supervision" by the apparatus, which is now so valued, in affording the scientist the most favorable opportunities for creative inquiry and for free intellectual labor. Of course, such an approach will offend to the bottom of his heart the bureaucrat who has become accustomed to pedantic adherence to plans and schedules, but the history of science forces us to doubt that discoveries lend themselves to planning. They happen where, as has been repeatedly observed, the creative environment is conducive to this....

When you talk with colleagues and students of Keldysh, most often there are recalled various incidents, the essence of which consists in one thing: Keldysh supported the unfledged young scientist in a disputation with any omnipotent elder. Keldysh encouraged in every way the struggle of different schools and scientific competition. Incidentally, "encouragement" is an imprecise word, this was his element. He did not visualize science outside dissent, outside the mutually enriching coexistence of opposing positions. Such was the case at the Institute of Applied Mathematics, where Keldysh was director until the most tragic end and where irreconcilable mathematical schools got on without conflict. Such

was also the case in our space field, which Keldysh, being the permanent chairman of the Intersectorial Scientific and Technical Council, continuously supervised for two decades. Owing precisely to his support Chelomey's Proton booster rocket, which had been subjected to concerted attacks and which to this day remains our basic "work horse" in astronautics, was realized. Here it did not matter that Keldysh was personally on strained relations with Academician V. Chelomey. Such was also the case in basic science, where the president, for example, afforded Academician B. Konstantinov the opportunity to check experimentally the absolutely heretical hypothesis of antimatter in the solar system.

There are countless such examples. The atmosphere of free thinking and creative inquiry, which was cultivated by the president, simply could not but yield vigorous shoots in both basic and applied research. One of the students of Keldysh recalled: Even the new-fangled conversion was begun under him. Only not the current, irrational, "frying pan" conversion, but conversion useful to society: Combat missiles were transformed into spacecraft, nuclear energy was transformed into peaceful power engineering, computers began to be introduced in the national economy. After Keldysh an Ugryum-Burcheyev aspiration to determine who is right and to give that person all power prevailed (in the word "bureaucracy" the second root is more frightening, it also means "power"). Now arguments are like outbursts of very scattered galaxies. Life is far more tranquil, but for some reason new ideas have not been heard for a long time, and even where we were among the leaders, we are gradually rolling back. Basic science is pulverizing the old achievements, while simply no one needs applied fields, the executives of the academy are giving them up with disgust.

Remember from the works of Zhvanetskiy: The television, which was produced by the plant, does not work, but this is nothing, because in the socialist competition they took first place, the wall newspaper is a good one, and the reports were submitted on time. The bureaucratic system, no matter where it attaches itself, lives not for a cause, but for itself. This plant with the defective television resembles very much the present Academy of Sciences, which has turned into a ministry of science with all its attributes: a large number of bureaucrats, a dense forest of administrations, an involved system of financing and the coordination of any questions, a branchy hierarchy that goes beyond the horizon. In short, the apparatus is gaining space—science is deteriorating. It is so cramped for the apparatus that they built a skyscraper for it along and above the Moscow River. But comparatively recently, back under Keldysh, the old building in Neskuchnyy Sad sufficed bureaucrats for carrying out the functions of serving science, and they sat there, incidentally, with plenty of room. Keldysh curbed in every way the bureaucratic trends in the management of science. A minor, but characteristic detail: Socialist competition, an utter punishment for other scientific research institutes and a mockery of scientists, was never organized at his institute.

And under Keldysh the ordinary phenomenon today, when executives for the department of science hold several tens of responsible posts each, was absolutely unthinkable. It is clear to a simpleton that academicians are turning into wedding generals, not only lowering the prestige of science, but also contributing to its further bureaucratization. Respect for rank and hanging on the words of the authorities—all this was at variance with the moral position of the president and, hence, did not take root at the academy of that time. Incidentally, Keldysh himself, in addition to the post of president, held only two posts on scientific councils of the academy.

But, perhaps, the primary thing, which made incompatible the personality of Keldysh and the bureaucratic aspirations of the members of the academy apparatus, is the attitude of the president toward his own job. Personal responsibility, which for the bureaucrat is the most terrible of evils, not only did not scare Keldysh off—he sought it. Whether or not it is now possible, the president traveled all over the country and visited scientific centers and the industrial enterprises, where applied developments of scientists had found application. He tried to get to the bottom of things and spoke for a long time with rank and file developers, bringing about the incomprehension of the high-ranking retinue that accompanied him. While during flights of spacecraft Keldysh spent night after night at the Mission Control Center, which does not happen now not only with presidents, but also with other directors of interested institutes. Carefully and impartially, listening to all the arguments and allowing himself to change his own mind, he studied a problem, but, having made a decision, he defended it to the end at all levels. Is it worth treading once more on the pet corn of the present presidium of the USSR Academy of Sciences: Moral fortitude and far less explosive questions than the ones, on which Keldysh stood, obviously are lacking, often he performed the role of an obedient performer of assignments of superior instances.

It is very difficult for a person, who moves in the highest political spheres, to keep his position inflexible, for every question there invariably acquires an ideological nuance. But scientific truth is absolute, it does not know nuances. And therefore any, even a small concession to the authorities, which has been made against one's conscience, even though out of good motives, like a "Trojan horse" takes root in the soul and eats away all good initiatives. Keldysh was able to do much because he did not abandon his principles under any circumstances.

Academician A.N. Nesmeyanov, the predecessor of Keldysh in the post of president, lost it through the will of Khrushchev, "thanks" to his anti-Lysenko position. In such a situation Keldysh, it would seem, should have kept a little farther from this theme, which was fraught with trouble.

How Keldysh and his associates came out the winners in this struggle is a separate story, which illustrates effective methods of pushing scientific problems through in the party-clan nomenclature. But here is what is interesting:

In a famous, but still unpublished note to Khrushchev, which Keldysh wrote, he did not once mention the name of Lysenko. Not only, I think, out of cautiousness. The struggle was being waged not so much against "the people's academician" as against the pseudoscience, which was personified by him, and ideological charlatanism in research. During the same period "the whore of imperialism," cybernetics, was rehabilitated, the attacks of dilettante philosophers on relativistic physics and the theory of relativity were halted. In short, pseudoscientific theories were resolutely and completely cut off from science.

But the most frightening thing in mistakes, as Kapitza observed, is not the misconceptions themselves, but the fact that they acquire power. And can we assert that the group monopoly of the scientific truth, which was supported by the structures of power, and this is Lysenkoism, has passed into nonexistence? The lovers of the truth in all fields of science are raising a cry against the domination of united clans, and D.S. Likhachev is correct in asserting that our scientific environment is reproducing the virus of Lysenkoism. Back in the 1960's, for example, the Institute of Space Research received the functions of the head institution, but it had a powerful counterbalance—Keldysh himself and the Intersectorial Scientific and Technical Council headed by him. After the president the established structure remained, but no one could and wanted to oppose the monopolism of the Institute of Space Research....

It is turning out to be sad. Keldysh quelled many shortcomings, which are inherently characteristic of our style of the management of science, and, on the other hand, tried to cultivate methods that are conducive to the real, not mythical, flourishing of scientific research. But the unique experience of Keldysh turned out, however sad this is, to be unneeded by anyone. His successors in the post of president (it is also possible to speak about the directors of institutes, for within their own walls each of them is the same president) got carried away by improvements of the apparatus and by all kinds of management innovations. Perhaps, such initiatives will also contribute some day to successes of science, although today there is also forming among many scientists the bitter conviction that the academy is turning into an ordinary ministry. But in any case is it assiduous to ignore the experience and achievements of our predecessors? Though not by a lot, the style of management of the academy in this case will be improved. If there is no such practice, if every manager begins from scratch, brushing off, like bread crumbs from the table, the grains of wisdom, which were found by others, we will not come to anything other than a sad result.

Portraits of Keldysh now hang in a conspicuous place. But this memory is formal, it is not filled with real life. The management structures, which under Keldysh remained in the secondary, auxiliary roles that were prescribed for them, are acquiring a self-sufficing meaning, monopolism is triumphing everywhere—the

sciences are groaning. But the "model" of Keldysh for the problems of modern science has acquired even greater topicality.

Should we not talk about this at the festive meetings devoted to the anniversary of Mstislav Vsevolodovich Keldysh?

Experimentation With Perftoran Blood Substitute Continues

917A0125A Moscow *RADIKAL* in Russian No 5,
Dec 90 p 3

[Article by Vladimir Pokrovskiy: "Perftoran Is Alive!"]

[Text] I hasten to make readers happy—the moratorium on the discussion in the press of the "blue blood" incident that caused a sensation (see *RADIKAL*, No 4), which was announced at the request of Academician Dmitriy Knorre by Corresponding Member of the USSR Academy of Sciences Genrikh Ivanitskiy, one of the developers of the preparation, is being repealed. Almost immediately after the appearance in *VESTNIK AKADEMII NAUK SSSR* of the article of Ivanitskiy, which by an understanding with Knorre became a point for further polemics, *PRAVDA* (22 November, "On Glasnost, Ethics, and Competence") published a new article against perftoran, which was signed by Academicians Vadim Ivanov and...Dmitriy Knorre!

For me personally this is inexcusable. For by the very fact of the publication of this article in *PRAVDA* the respected academician is acknowledging before millions of readers that he does not consider it necessary to burden himself with the fulfillment of his own obligations.

The main thing is that because of something he would have ruined his reputation—the article is a most ordinary one, which in the past was not read once. There are arguments, which were refuted long ago, and accusations, which were uttered long ago—the developers of perftoran are deceivers, perftoran does not exist, and journalists, including the author of these lines, who was favored with the honor of being mentioned in *PRAVDA* (for which I say thank you), are biased and incompetent.

The basic spirit of the article is also not original: "Do not dare sling mud at the name of deceased Academician Ovchinnikov!" "Say nothing but good about the dead" is a principle, with which you will not dispute. True, if people had followed it, we would not have such a science—history. But people—for example, the same authors of the *PRAVDA* article—are particularly not following it. They calmly sling mud at another dead

man—Professor Beloyartsev, who was persecuted until he committed suicide—accusing him of thefts of alcohol and prizes—crimes that, incidentally, have not been proved by anyone.

Ivanitskiy himself is also extremely amazed by the behavior of Academician Knorre. "This is completely incomprehensible," he told the author of these lines. "Knorre did not say a word to me about the article in *PRAVDA*, which was being prepared. On the contrary, he persuaded me to exert every effort to halt the discussion in the press."

But, apparently, one can no longer halt either the discussion in the press or the very incident with "blue blood." A spark seemed to begin to appear, a happy ending began to be felt. On 24 November a document, which actually permits perftoran to be used for the treatment of people, came from the depths of the academy. And, of course, Academician D. Knorre, who had asserted two days earlier that perftoran does not exist, had signed it.

As Ivanitskiy reported, approximately a year ago he concluded a contract with the *Mikrokhirurgiya glaza* Interbranch Scientific Technical Complex, in accordance with which a number of preparations specifically for ophthalmology were developed on the basis of perftoran. Testing yielded very good results, and Svyatoslav Fedorov addressed a letter to the USSR Academy of Sciences with the request to turn over to him a pilot industrial section for the production of perftoran, which many years ago was idled at the Institute of Biophysics. Now, after comparatively short, by our standards, ordeals, production has been turned over to Ivanitskiy.

"Now," say Ivanitskiy, "the second stage—the purchase of equipment abroad—is beginning. If everything goes normally, sometime in the second half of next year the production of perftoran will be started.

"The fact that the life of perftoran is beginning with ophthalmology is very apt. It will be expensive—apparently, about 200 rubles per liter. If we were to begin, let us suppose, with transplantology, where every operation requires many liters of perftoran, we would be faced with financial problems that are hard to solve. But operations on eyes require small quantities of the preparation, which will enable us to develop the technology of its production, without putting our hand too far into the pocket of the patient or the state.

"Subsequently we hope also to switch to other applications of 'blue blood'—perhaps, we will succeed in decreasing its production cost. It is also possible that in the near future new forms of medical service (insurance medicine and so forth) will appear—this will also help perftoran get on its feet."

Nominees for State Prizes in Science, Technology Announced

917A0123A Moscow IZVESTIYA in Russian 17 Apr 91 p 3

[Article: "From the Committee for Lenin and USSR State Prizes in Science and Technology"]

[Text] The Committee for Lenin and USSR State Prizes in Science and Technology reports that the following works have been allowed to participate in the second round of the competition for the 1991 USSR State Prizes:

1. N.N. Bogolyubov, Yu.A. Mitropolskiy, A.M. Samoylenko, Ye.A. Grebenikov, Yu.A. Ryabov. "New Mathematical Methods in Nonlinear Analysis."

Submitted by the Institute of Mathematics of the Ukrainian SSR Academy of Sciences.

2. V.M. Zolotarev. "Basic Studies of the Properties of Stable Distributions."

Submitted by the Mathematics Institute imeni V.A. Steklov of the USSR Academy of Sciences.

3. A.A. Samarskiy, N.V. Zmitrenko, A.P. Mikhaylov, S.P. Kurdyumov, V.A. Galaktionov, G.G. Malinetskiy, G.G. Yelenin, Yu.A. Klovov. "The Development of the Mathematical Theory of Modes With Peaking and of Localized Structures in Nonlinear Media."

Submitted by the All-Union Center of Mathematical Simulation of the USSR Academy of Sciences.

4. Zh.I. Alferov, S.A. Gurevich, M.N. Mizerov, Ye.L. Portnoy, V.B. Smirnitskiy, R.A. Sirus, V.I. Kuchinskiy, R.F. Kazarinov. "The Elaboration of the Principles, Basic Research, and the Development of Semiconductor Lasers With Distributed Feedback."

Submitted by the Physical Technical Institute imeni A.F. Ioffe of the USSR Academy of Sciences.

5. A.D. Akhsakhalyan, S.V. Gaponov, V.M. Genkin, B.M. Luskun, Yu.Ya. Platonov, N.N. Salashchenko, A.V. Vinogradov, A.I. Fedorenko. "The Development of Multilayer Optics of the Soft and Ultrasoft X-Ray Wavelength Range."

Submitted by the Institute of Applied Physics of the USSR Academy of Sciences.

6. B.V. Deryagin. "The Development of the Theory of Stability of Colloids and Thin Films."

Submitted by the Institute of Physical Chemistry of the USSR Academy of Sciences.

7. Yu.I. Yermakov, V.A. Likholobov, F.S. Dyachkovskiy, A.D. Pomogaylo, B.N. Kuznetsov, G.V. Lisichkin, Yu.N. Novikov, V.I. Smetanyuk. "The Development of the Scientific Principles of the Synthesis and Application of Heterogenized Metal Complexes."

Submitted by the Institute of Catalysis of the Siberian Department of the USSR Academy of Sciences.

8. A.A. Krasnovskiy, N.V. Karapetyan, V.A. Shuvalov, V.V. Klimov, Yu.Ye. Yerokhin, A.V. Klevanik, V.B. Yevstigneyev. "The Revelation of the Molecular Mechanisms of Photobiochemical Transformations of Chlorophylls in the Reaction Centers of Photosynthesis."

Submitted by the Institute of Biochemistry imeni A.N. Bakh of the USSR Academy of Sciences.

9. Yu.I. Polyanskiy, I.B. Raykov, T.V. Beyyer, A.L. Yudin, A.Ye. Khovanskikh, D.V. Osipov, L.N. Sevarin, S.S. Shulman. "The Basic Study of the Functional Morphology, Biochemistry, and Evolution of One-Celled Organisms."

Submitted by the Institute of Cytology of the USSR Academy of Sciences.

10. O.A. Bogatkov, V.I. Gonshakova, V.I. Kovalenko, V.A. Kononova, Ye.Ye. Lazko, I.D. Ryabchikov, Ye.V. Sharkov, V.V. Yarmolyuk. "Studies of the Evolution of Igneous Rocks of Various Geodynamic Situations in the Geological History of Earth."

Submitted by the Institute of Geology of Ore Deposits, Petrography, Mineralogy, and Geochemistry of the USSR Academy of Sciences.

11. N.I. Voronin, G.A. Gavrielyants, D.M. Magomedov, N.V. Mizinov, A.Ya. Mordovin, V.A. Shatin, Yu.L. Tsvedel, B.V. Yakubenko. "The Discovery and the Optimization of the Prospecting of the Unique Astrakhan Sulfur and Gas Condensate Deposit."

Submitted by the Nizhnevolszhsk Geological Production Association.

12. N.I. Nikolayev. "The Development and Establishment of the Neotectonic Direction in the Earth Sciences."

Submitted by the Moscow Geological Prospecting Institute imeni Sergo Ordzhonikidze.

13. A.S. Alekseyev, V.P. Pyatkin, Ye.P. Danyulis, N.M. Zubkov, R.I. Elman, A.S. Isayev, V.I. Sukhikh, V.N. Sedykh. "The Aerospace Monitoring of Taiga Forests."

Submitted by the Institute of Forestry and Timber imeni V.N. Sukachev of the Siberian Department of the USSR Academy of Sciences.

14. B.V. Leonov, V.I. Kulakov, V.A. Lukin, Ye.A. Kalinina, V.M. Zdanovskiy, I.M. Gryaznova, A.I. Nikitin, G.A. Savitskiy. "The Development and Introduction of an Outpatient Method of the Treatment of Infertility by Means of Extracorporeal Fertilization."

Submitted by the All-Union Scientific Research Center for the Protection of the Health of Mother and Child.

15. A.P. Romodanov, O.V. Kopyev, N.I. Lisanyy, Ye.G. Pedachenko, N.Ye. Polishchuk, V.V. Lebedev, L.B. Likhterman, A.A. Potapov. "The Study of the Pathogenesis and the Development and Introduction in Practice of Methods of the Diagnosis and Treatment of Acute Hidden Cranial Trauma."

Submitted by the Kiev Scientific Research Institute of Neurosurgery.

16. V.V. Serov, V.A. Varshavskiy, L.V. Lysenko, N.A. Mukhin, M.A. Paltsev, I.Ye. Tareyeva, M.Ya. Ratner. "Basic Studies of the Problem of Glomerulonephritis."

Submitted by the Moscow Medical Academy imeni I.M. Sechenov.

17. I.M. Botbayev, A.V. Khmyrov, B. Budaychiyev, Zh. Dzhamankulov, A.D. Petrichuk, A.K. Kalmamatov, M.S. Satybaldiyev, L.S. Stefanyuk. "The Breeding of a Unique Alayskiy Breed of Semicourse-Wooled Sheep."

Submitted by the Kirghiz Scientific Research Institute of Animal Husbandry.

18. Ts.Ts. Khanduyev, P.P. Valuyskiy, E.D. Imanov, B.N. Gusev, A.T. Zhunushov, V.I. Sitkov, Ye.V. Makarova, B. Salidinov. "The Development of the Theoretical Principles of the Design and Industrial Biotechnology and the Introduction in Veterinary Practice of a Highly Antigenic Live Culture Vaccine Made From Strain 'L' Against Contagious Pustular Dermatitis (Stomatitis) of Sheep and Goats."

Submitted by the Kirghiz SSR Academy of Sciences.

19. Yu.V. Yakovets. "The Study of the Set of Laws of Scientific and Technical Progress and the Substantiation of the Economic Mechanism of Their Use."

Submitted by the Academy of the National Economy.

20. Yu.N. Karaulov. "The Study of the Structure and Functioning of the Russian Language Personality (Theory, Experiment, Model)."

Submitted by the Institute of the Russian Language of the USSR Academy of Sciences.

21. A.N. Tikhonov. "Slovoobrazovatelnyy slovar russkogo yazyka" [Word-Formation Dictionary of the Russian Language] in two volumes (Moscow "Russkiy yazyk", 1985).

Submitted by the Institute of the Russian Language of the USSR Academy of Sciences.

22. A.K. Belitchenko, A.S. Kostin, Yu.A. Belov, Ye.F. Lysov, A.M. Rotenberg, P.M. Plyushchenkov, V.G. Makarov, A.V. Leytes. "The Development and Assimilation of the First Domestic High-Performance Six-Impression Radial Machines of the Continuous Casting of Billets."

Submitted by the Moldavian Metallurgical Plant.

23. M.Ye. Goncharenko, A.V. Daniltsev, D.K. Zhabitskiy, N.P. Ikonnikov, P.K. Kolosha, M.A. Novichenko, I.G. Osipov, B.D. Radyuk. "The Development and Establishment of an Aviation Industry Complex for the Series Production of Widebody Heavy and Superheavy Cargo and Passenger Airplanes Like the An-124 (Ruslan), An-225 (Mriya), Tu-203, and Others in the City of Ulyanovsk."

Submitted by the USSR Ministry of the Aviation Industry.

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1. A.F. Aleksandrov, L.S. Bogdankevich, A.A. Rukhadze. "Osnovy elektrodinamiki plazmy" [The Fundamentals of the Electrodynamics of Plasma] (2d edition, Moscow, "Vysshaya shkola", 1988).

Submitted by the Physics Faculty of Moscow State University imeni M.V. Lomonosov.

2. V.Ye. Alemasov, A.F. Dregalin, A.P. Tishin. "Teoriya raketnykh dvigateley" [The Theory of Rocket Engines] (4th edition, Moscow, "Mashinostroyeniye", 1989).

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